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Critical Ecosystem Restoration Plan (CERP) of Sunkoshi River System



Building A Resilient Churia Region in Nepal
(BRCRN)
Project Management Unit, Babarmahal, Kathmandu

Building a Resilient Churia Region in Nepal (BRCRN)



National Project Director

मिति २०७८।०२।२७ को वन तथा वातावरण मन्त्रालयको श्रीमान् सचिवस्तरीय निर्णयबाट स्वीकृत भएको Critical Ecosystem Restoration Plan (CERP) Preparation Manual को बुँदा नं.४ को प्रावधान बमोजिम PPMU हरुको सिफारिशमा PMU को मिति २०८०।०२।२३ को निर्णयबाट प्रारंभिक स्वीकृत (Initially Approve) भएको यस नदी प्रणालीको CERP मिति २०८०।०२।२६ मा बसेको आयोजना निर्देशक समिति (Project Steering Committee) को निर्णय बमोजिम अनुमोदन (Endorse) भएको ।


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National Project Director

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This CERP report has been prepared based on the extensive field consultations, onsite visit and applying the RS/GIS tools and technologies. This report contains data and information collected and collated from the field applying CERP steps and methodology spelled -out in MOFE approved CERP manual. The draft report was shared in three provincial and one national validation workshops organized from December 2022 to February 2023 and incorporated the suggestions obtained from the workshops.

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APPROPRIATE TECHNOLOGY DEVELOPMENT AND RESEARCH

Date: 27th March 2023

DECLARATION OF AUTHENTICITY

We the following team members of CERP formulation process from Grid-ECN-Sunakhari JV hereby declare that the data and information provided in the CERP reports of Koshi province are correct to best of our knowledge and duly in-line as per MOFE approved CERP manual, using participatory approach with sample site verification. Thus, this document is our original outcomes of local, river cluster, province and federal level consultations/ validations. We hereby verify to prove its originality and authenticity; we will not allow our team and other sources to make it copied resources in one way or the other without citing copyright that is GoN-BRCRN project. We duly acknowledge BRCRN'S FAO-TA for their active involvement in every stage of CERP development..

Thanking you
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ACRONYMS AND ABBREVIATIONS

| | | |
|---------|---|---|
| AKC | : | Agriculture Knowledge Center |
| ANR | : | Assisted Natural Regeneration |
| BRCRN | : | Building a Resilient Churia Region in Nepal |
| CBFMG | : | Community Based Forest Management Groups |
| CBO | : | Community Based Organization |
| CBS | : | Central Bureau of Statistics |
| CCA | : | Climate Change Adaptation |
| CCM | : | Climate Change Mitigation |
| CERP | : | Critical Ecosystem Restoration Plan |
| CF | : | Community Forest |
| CFUG | : | Community Forest User Group |
| CRLUP | : | Climate Resilient Land Use Planning |
| D&FD | : | Deforestation and Forest Degradation |
| DFO | : | Division Forest Office |
| DHM | : | Department of Hydrology and Meteorology |
| DoS | : | Department of Survey |
| DRR | : | Disaster Risk Reduction |
| EIA | : | Environment Impact Assessment |
| FFS | : | Farmer Field Schools |
| FGD | : | Focus Group Discussion |
| FOP | : | Forest Operational Plan |
| FPIC | : | Free, Prior and Informed Consent |
| GESI | : | Gender Equality and Social Inclusion |
| ha | : | hectare |
| ICIMOD | : | International Centre for Integrated Mountain Development |
| IEE | : | Initial Environmental Examination |
| IP | : | Indigenous People |
| IPacks | : | Intervention Packages |
| IPM | : | Integrated Pest Management |
| Km | : | Kilometer |
| LRP | : | Local Resource Person |
| m | : | meter |
| MCA | : | Multi Criteria Analysis |
| MoFE | : | Ministry of Forests and Environment |
| PCTMCDB | : | President Chure Terai Madhesh Conservation Development Board |
| PCTCMMP | : | President Chure Terai Madhesh Conservation and Management Master Plan |
| PPMU | : | Provincial Project Management Unit |
| RS | : | River System |
| SDFO | : | Sub-division Forest Office |
| SDG | : | Sustainable Development Goals |
| SFM | : | Sustainable Forest Management |
| SNRM | : | Sustainable Natural Resource Management |
| TOF | : | Training of Facilitators |
| VDC | : | Village Development Committee |

EXECUTIVE SUMMARY

The project entitled “Building a Resilient Churia Region in Nepal (BRCRN)” aims to promote widespread adoption of climate-resilient land use practices; confront the challenges of deforestation and forest degradation (D&FD); better maintain the forest ecosystem in the Chure hills; and build resilience to climate-induced hazards by linking the Chure hills, Bhavar and Terai. BRCRN has adopted the river system-based approach and follows boundaries earlier identified and delineated by President Chure Terai Madhesh Conservation and Management Master Plan 2017. The said master plan projected integrated conservation plan on the basis of river systems. The Critical Ecosystem Restoration Plan (CERP) is prepared to foster Climate Resilient Sustainable Natural Resource Management (CR-SNRM) in the river system so that this CERP will be launched to implement the concept of upstream-downstream linkage based on perspectives of the ecosystem services. The CERP process has followed participatory rural development planning approach including civil society organizations (CSOs), community-based organizations (CBOs), women lead organization, and groups, and government entities at different levels. It is based on ‘Theory of change’ approach integrating problem and solution tree analysis that explains how a given intervention, or set of interventions, is expected to lead to specific development change, drawing on a causal linkage based on available evidence. From problem and solution tree analysis the main problems along with their causes and effects are recorded, to come up with clear and manageable goals and the strategies to combat them. There are two main stages to this process: (1) the identification of negative aspects of existing situations (or key challenges) in the form of problem trees, and (2) the change of the problems into objectives leading to solution trees showing potential solutions or strategies that respond to the main drivers and underlying causes. In addition, the integrated and gender-specific approach was adopted during the process to ensure gender equality and women empowerment in sustainable natural resource management. The integrated approach adopted gender-inclusive actions such as ensuring equal participation, gender prospect in problem-solution analysis, and ensuring participation of women lead organizations in the consultation workshops. However, due to the limited involvement of women in the integrated approach, a gender-specific approach was adopted, and a separate study focusing only on women and women lead organizations was conducted during the process. In addition, the approach adopted particular research tools such as seasonal calendars, problem and solution community workshops, and focus group discussions among women, Dalits, IPs, women, and other marginalized communities. Also, the consultation process includes a consultation with women and women lead organizations.

Sunkoshi river system is north-facing Chure hill that extends to Sunkoshi river and is situated north to Gideri river system. It is extended over 26.920759° to 26.861168°N and 86.960268° to 87.178281°E. Forests cover 82.5% of total area of the river system which has been increased at the annual rate of 0.08% during 2000-2019. The ecosystem degraded areas termed as “hotspot” areas are identified initially by spatial analysis of 16 different variables from secondary spatial data sources. The variables were categorized into adaptation and mitigation themes and Geographical Information System (GIS) based Multi-Criteria Analysis (MCA) was used to identify preliminary hotspot areas. The maps generated from spatial analysis were taken to problem and solution workshops that took place at the local level. Participants from Community Based Organizations (CBOs) user groups- with a focus on women, indigenous people, poor and Dalit (community and collaborative forest user groups, farmer groups, and climate-induced disaster management groups, soil and water conservation groups) as well as government organizations (forest sub-division offices and local government at community level) were represented in the workshops. Identification of key drivers, problem analysis, solution analysis, and hotspot map delineation were done in two thematic groups of climate change adaptation and mitigation. The mapped hotspot locations were verified/updated in workshops and visited-verified in the field followed by

discussions with the local communities. Additional two-day expert planning workshop in the river system discussed and validated the findings, focusing on identifying drivers and underlying causes of the two thematic problems.

Deforestation and forest degradation are related to climate change and pose threats to biodiversity and livelihood of forest dependent local communities. Forest degradation relates to loss of biomass (carbon) and reduction in the capacity of forests to produce ecosystem services on longer terms. The findings from local stakeholder and expert consultations indicate that unsustainable/ illegal harvesting of forest products, open/uncontrolled grazing, forest fire, adopting inappropriate cropping systems, encroachment of forestlands, ineffective forest management practices and infrastructure development are major drivers of deforestation and forest degradation in Sunkoshi river system. Erosion/landslide is other drivers contributing to forest loss and degradation. These drivers are the results of several underlying causes- high forest resource dependency; poverty and limited livelihood opportunities available to local communities; ineffective forestry sector governance; weak law enforcement; ineffective sustainable forest management; financial and human resource constraints in community based forest user groups and forest offices; and weak coordination and cooperation among concerned agencies that have led to such degradations in this river system.

Climate induced disaster and climate impact on agriculture productivity are two key challenges representing vulnerable ecosystem and community in the river system. Erosion/landslide and weak disaster risk management are major drivers, and are triggered by both natural and anthropogenic factors. Inappropriate land use practices like cultivation in slopy areas more than 30 degree, forest degradation, and unplanned and unregulated road construction are main human-induced causes. Heavy/erratic rainfalls, steep slopes and other topographic conditions are major natural causes. Climate stress on agriculture productivity has direct impact on people's livelihood especially women, elderly and children through low family income and food insecurity. It eventually makes forest ecosystem vulnerable through increased burgeoning pressure on forest resources. The major drivers identified are inadequate farm skills and financial resources; insufficient irrigation; and pests and diseases.

The strategic actions identified to reduce deforestation and forest degradation include reducing forest dependency by addressing poverty and alternative livelihood issues; promoting agroforestry, livestock management; strengthening forest fire control system; controlling open grazing; improving law enforcement and overall forestry sector governance; promoting sustainable forest management; controlling further encroachment of forestlands; and capacity enhancement of user groups and government forestry staffs. Afforestation and reforestation activities are proposed to enhance forest density and species richness for improving ecosystem services. One of the important aspects of enhancing adaptation/resilience of ecosystem and community would be climate resilient farming practices and enhancing agricultural productivity. Increase in agriculture productivity will improve livelihood of small holding farmers and at the same time, it will decrease dependency on nearby forest resources. Strategic actions proposed for disaster risk reduction are landslide treatment, erosion control and strengthening disaster risk management. In addition, the focus is also on enhancing gender inclusive governance to mainstream women, Dalits, indigenous people, and marginalized communities in the implementation of ecosystem restoration plans for the river system.

Based on the activities and key results identified from local stakeholder workshops, via problem tree and solution tree analysis, five intervention packages (IPacks) have been developed. This CERP only covers those key results and IPacks that correspond to local level interventions. CERP brings out issues on a number of vital areas of interventions that can take place at national level such as- resolution of land tenure issues; and interventions to regulate infrastructure development in forest area, however

does not suggest specific interventions as guided by CERP manual. Feasibility analysis is used to assess the strengths and weaknesses of the IPacks where risks and obstacles to implementation of each IPacks were assessed. Safeguard analysis is done to identify social and environmental risks or threats, as well as to identify where CERP interventions can contribute to significant social or environmental co-benefits. The measures to mitigate risks and enhance benefits are also assessed. Budget plan and monitoring protocol for CERP are also prepared adopting several matrixes. However, geographic focus of activities is not considered as a primary criterion for activity grouping during IPack formulation.

The IPacks developed mainly focused on reducing deforestation and forest degradation; enhancing adaptation/resilience of vulnerable ecosystem and local communities; raising awareness and enhancing capacity of CBOs and government staffs; and integrating gender and social equity issues. The IPacks provide adaptation and mitigation activities for forest management and subsequent carbon enhancement; climate resilient agriculture and land use practices; and reducing ecosystem and community vulnerability to climate-induced disasters. The activities such as agroforestry, plantation to improve forest/tree cover, gully control, landslide treatment, and climate resilient land use practices to build resilience of farming households against climate change impacts are intended to enhance resilience against climate-induced soil erosion and reduce soil runoff thus reducing risks related to sedimentation in lowlands. However, geographic focus of activities are not considered as a primary criterion for activity grouping during IPack formulation, as river systems such as Sunkoshi, that entirely fall in upstream Churia region and has similar terrain, topography and geological variations throughout where similar problems and solutions apply across the entire river system area.

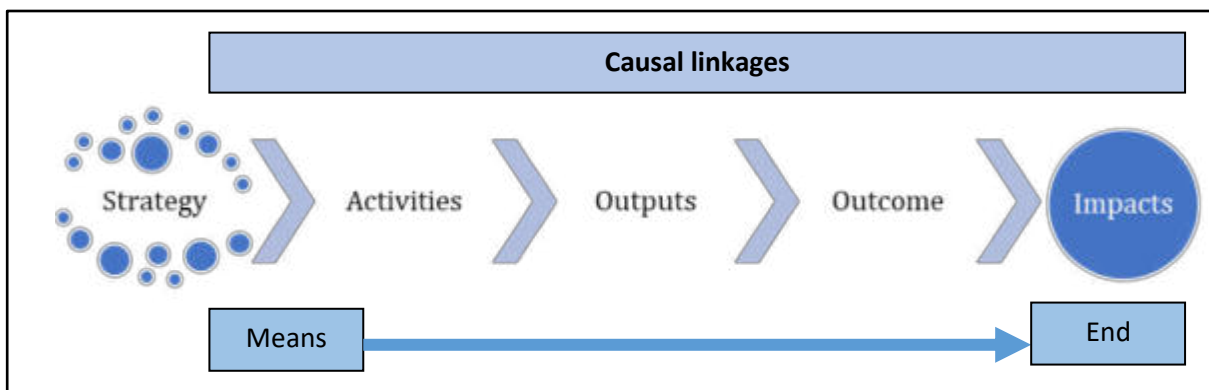
CHAPTER I : INTRODUCTION TO CRITICAL ECOSYSTEM RESTORATION PLAN

1.1 Background

The project entitled “Building a Resilient Churia Region in Nepal (BRCRN)” is implemented in 26 critical river systems (RS) in the southeast region of Nepal, covering parts of Provinces I, Madhesh and Bagmati. The project will be linking the Chure hills, Bhavar and Terai, and aims to promote widespread adoption of climate-resilient land use practices, confront the challenges of deforestation and forest degradation (D&FD), better maintain the forest ecosystem in the Chure hills, and build resilience to climate-induced hazards so that the ecosystem services perpetuated in the longer terms.

The Chure Hill is an ecologically highly sensitive and risk-prone landscape due to complex geology, tectonics, climate, hydrology, and biodiversity. Ecologically Churia is an integral part of Terai, thus, it should be considered as a landscape. Watershed level institution building and its well-functioning including upstream and downstream stakeholders can contribute in conservation and management of upstream watershed resources. This CERP has been planned in a way which ensures protection of upstream areas and hence downstream will have perpetuated ecosystem services on longer terms. The region is particularly vulnerable to erosion, landslides, drought and flooding due to ongoing tectonic processes, fragile geological composition, and prolonged and intense rainfall during monsoon (Ghimire, 2011). A changing climate is further contributing to landslides, erosion, and flash floods in the hills. These processes in the hills have shaped the active geomorphological activities in the Bhavar region through aggradation and transportation of sediments. Over the last half-century, Bhavar have undergone tremendous changes in demography, land use, settlement and urbanization, and road infrastructures, which have extremely altered the landscape. Moreover, haphazard extraction of the riverbed material has altered the geomorphic processes in the Bhavar (Dahal & Paudyal, 2022). Higher sediment yield in Chure hill and alteration of geomorphological processes in Bhavar have profound impact on the morphology of the river and related disaster in the downstream area of Terai flood plain (Ghimire, 2020). The agricultural land of Bhavar and Terai are already in stress of climate variability, further jeopardizing the livelihoods of the inhabitants.

In these connections, Critical Ecosystem Restoration Plan (CERP) has been prepared to foster Climate Resilient Sustainable Natural Resource Management (CR-SNRM) at river system level. CERP activities are designed with focus on upstream-downstream linkages based on perspectives of the ecosystem services. The CERP has followed a participatory rural development planning approach including civil society organizations (CSOs), community-based organizations (CBOs) and government entities at different levels. This methodology and process is based on international best practices, including the ‘Theory of change’ approach to planning, implementation, monitoring & evaluation and impact assessment in different time intervals.



(Source: CERP manual, 2021)

Figure 1: Establishing casual linkages with theory of change analysis

Since the “Theory of change” approach explains how a given intervention, or set of interventions, is expected to lead to specific development change drawing on a causal linkage based on available evidence, CERP has translated the field information into the desired activities, outputs, outputs, outcomes and impacts of the project and highlighted the current situations and dynamics including their incentives for change towards expected results.

1.2 River System Concept: Holistic Approach of Integrated Watershed Management

The President Chure Terai Madhesh Conservation and Management Master Plan 2017 projected integrated conservation plan based on river systems. A river system is a land mass of drainage basin where all river and its tributaries meet to have a common outlet. BRCRN follows the river system boundaries earlier identified and delineated by President Chure Terai Madhesh Conservation and Management Master Plan (PCTMCDB 2017). It is a part of watershed management system that should ideally follow hydrological boundary, however, river system delineation in PCTMCMMP also considers land mass as a management unit that is delineated based on the geographical and socio-ecological variability.

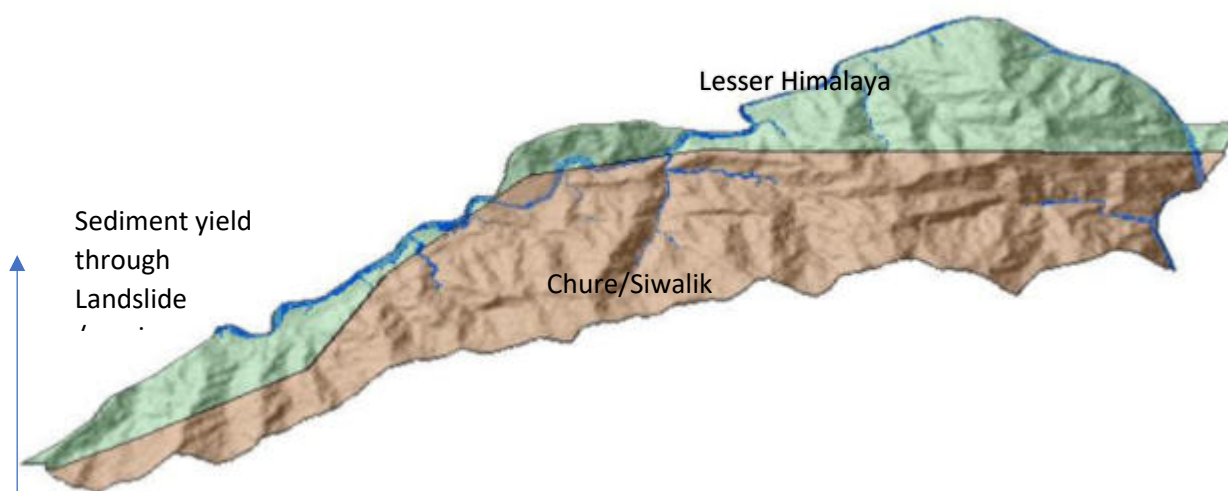


Figure 2: Upstream-downstream linkages in Sunkoshi river system

Sediment generates through erosion and slope failure process in the upstream cause temporary aggradation and transport to Saptakoshi River.

1.3 Ecosystem Restoration

Ecosystem degradation is a negative trend in ecosystem condition, caused by direct or indirect human-induced processes including anthropogenic climate change perpetuated by anthropogenic factors, expressed as long-term reduction or loss of at least one of the following: biological productivity, ecological integrity, or value to humans in one way or the other.

Ecosystem restoration is any intentional activities that accelerate the recovery of degraded, damaged, or destroyed functional services that an ecosystem provides. The restoration planning requires multi-dimensional observation and analysis of core problems followed by a multi-stakeholder engagement and decision making process. Relating ecosystem services with relevant stakeholders for their perceptions of the services is vital for informed decision making about land use changes and resource management. Likewise, the site-specific information on land use and their changes is equally important. Hence, CERP processes have ensured rigorous field level discussions and consultations in each river system as well as exercised tools and techniques of land use and change dynamics to accommodate all the aspects of ecosystem restoration. The findings of the processes at multiple levels are then turned into the intervention packages of the CERP so that the specific ecosystems are restored.

In fact, CERP focuses on river system scale intervention planning to achieve ecosystem restoration at landscape level. Moreover, the CERP is guided by and perfectly in-line with the principles of ecosystem restoration of United Nations decade 2021-2030 that highlights following 10 principles that underpin ecosystem restoration:

- Ecosystem restoration contributes to the UN SDGs and goals of Rio conventions.
- Ecosystem restoration promotes inclusive and participatory governance, social fairness and equity from the start and throughout the process and outcomes.
- Ecosystem restoration includes a continuum of restorative activities.
- Ecosystem restoration aims to achieve the highest level of recovery for biodiversity, ecosystem health, integrity, and human wellbeing.
- Ecosystem restoration addresses the direct and indirect causes (drivers) of ecosystem degradation.
- Ecosystem restoration promotes knowledge generation and exchange throughout the process.
- Ecosystem restoration is based on well-defined goals.
- Ecosystem restoration is tailored to the local ecological, cultural and socio-economic contexts, while considering larger landscape.
- Ecosystem restoration includes monitoring, evaluation and adaptive management throughout and beyond the lifetime of project.
- Ecosystem restoration is enabled by policies and measures that promote its long term progress, replication and scaling-up.

1.4 Rationale of CERP

Most part of Churia is covered by forests while some parts are inhabited and cultivated. Increasing human interferences and expanding infrastructures coupled with climate vagaries on top of its own fragile-composition are causing serious threats to this region and downstream also. It has varying elevation, climate and vegetation from one to another part. Churia (upstream) area has been considered to be very important for conservation to protect downstream Terai and its agriculture land. CERP has

been formulated in a way which implements the concept of upstream-downstream linkage based on perspectives of the ecosystem services. The development of CERP will contribute to the provision of climate-informed extension, leveraging the resources and advisory services. It ensures that adaptation to climate change (CC) and Disaster Risk Reduction (DRR) has been integrated into provincial and local development planning cycle. The project achieves this through promotion and integration of climate resilient land use practices in agriculture and forestry, subsequently integrating them into local decision-making processes. This will ultimately guide the adoption of prioritized low-carbon and climate resilient – integrated Sustainable Natural Resource Management in the Chure region.

The goal is that government and development partners together improve local and provincial service delivery through river system interventions in CR-SNRM sector. The CERP is also the basis for monitoring and evaluation (M&E) of ecosystem restoration actions at the landscape scale as well as outreach and targeted budgeting on local level. Additionally, the data generated in the annual follow-up of the CERP intervention packages, and their success or failure will inform government reporting on climate change related international commitments and instruments. The reports on the cumulative impacts of the CERPs can also inform country's overall Nationally Determined Contributions (NDC) reporting on land use change and greenhouse gas emissions at a national scale.

CERP is envisioned at a river system scale to foster upstream-midstream-downstream connectivity by analyzing complex inter-linkage of cause and effect dynamics of climate vulnerability over the specific geographic regions and interventions to help build the climate resilience with interlinked and cascading impact from head to tail of the river systems. In this sense, it adopts a holistic integrated watershed management approach.

CHAPTER 2 : METHODOLOGY AND THE PROCESS

2.1 CERP Development Phase

Following nine steps were followed during the CERP development phases:



Step 9: Development of workflow and finalization of intervention packages

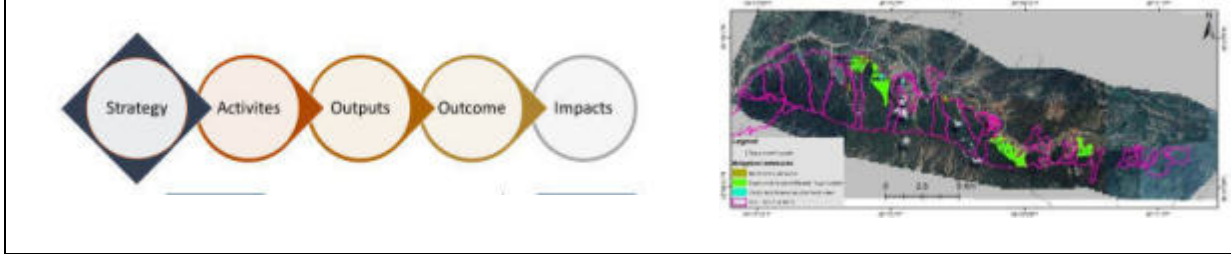


Figure 3: Steps of spatial analysis for CERP development

2.2 Spatial Planning as a Base for CERP

Mapping and spatial analysis have a vital role in the CERP development process. Maps and spatial analysis are generated by a combination of geospatial tools (i.e. GIS, Remote Sensing), desk-based research and fieldwork. Relevant analogue maps and data prepared by national and international agencies were collected and reviewed for the inclusion of the information in the digital spatial data as well as integration in the GIS.

Table 1: Data types, acquisition and their processing methods

| Themes | Parameters | Data types | Sources | Processing methods |
|--------------------|---|--|---|---|
| Climate mitigation | Deforested area | Forest loss (2000-2020) | Global Forest Watch data.globalforestwatch.org | - Revised & update from temporal Google earth images |
| | Degraded forest | Open forest (Canopy <20%) | Sentinel image, 2021 | - NDVI and supervised classification - Inputs, revised & update from temporal Google earth images |
| | Forest fire | Fire incident | NASA's Website (https://firms.modaps.eosdis.nasa.gov) | - Overlay analysis on temporal GE images and draw tentative burnt area which will verify during participatory workshops |
| | Potential enhancement area | Private land/Public land forest (Proxy indicators) | Cultivated land & Riverbed (DoS, 1996) | - Abandoned agricultural land (Cultivated land in the 1990's/2000's and barren/bushes in 2020's): Google earth overlay & Mapping - Abandoned river/reclaim (River in 1990's/2000's and other land use in 2020's): Google earth overlay & Mapping |
| | Firewood consumption | Household using firewood for cooking | CBS, 2011 | - Household using firewood attributed in then VDCs and transferred into RS |
| | Landslide on forest area | Landslide | PCTMCDB (TU-CDG, 2021) | - Landslide distribution in forest |
| | Road network on Chure hillslope | Road network on Chure hillslope | PCTMCDMP (PCTMCDB, 2016) | - Updated form Google earth |
| Climate adaptation | Agricultural land in slope area | Agricultural land Slope (Digital elevation model) | ALOS DEM (12.5m) (asf.alaska.edu) | Overlay analysis |
| | Agricultural land exposed to landslide hazard | Landslide hazard | PCTMCDB (TU-CDG, 2021) | |
| | Agricultural land exposed to Flood hazard | Flood hazard | PCTMCMMP (PCTMCDB, 2016) | |
| | Land capability | Land capability | Soil and Terrain Database (SOTER) (FAO, 2009) | |

| Themes | Parameters | Data types | Sources | Processing methods |
|--------|--|------------------------|-------------------------------------|--|
| | Landslide hazard | Landslide hazard | PCTMCDB (TU-CDG, 2021) | Overlay analysis |
| | Flood hazard | Flood hazard | PCTMCDMP (PCTMCDB, 2016) | Flood hazard is revised and updated based on recent geomorphic change in flood plain using the temporal images of GE |
| | Settlement exposed to landslide hazard | Settlement | Land cover, 2015 (PCTMCDB, 2016) | Overlay analysis |
| | Settlement exposed to flood hazard | Settlement | Land cover, 2015 (PCTMCDB, 2016) | |
| | Wetland/water recharge | Wetland/water recharge | Wetland (DoS, 1996 & PCTMCDB, 2016) | |
| | House structure | Indices | CBS, 2011 | Spatial representation was created on then VDCs and transferred into river systems |
| | Ethnicity | | | |
| | Female literacy (Gender) | | | |

CERP is the core process of the project in identifying the problems and solutions that lead to project interventions (activities). The CERP objectives were to balance both mitigation and adaptation for climate resilience building of local vulnerable communities. Hence, mitigation and adaptation potentials of the project are considered as primary entry points for MCA to identify hotspot sites and considered as major themes. Mitigation potential is addressed through identifying areas (hotspots) where BRCRN interventions have potential to reduce emissions and enhance the subsequent carbon stock. Similarly, adaptation potentials are addressed through identifying areas (hotspots) where BRCRN interventions have potential to address vulnerable ecosystems and vulnerable local communities.

Following graphics demonstrate adaptation and mitigation logic adopted for which careful choice of themes, variables, process and results were:

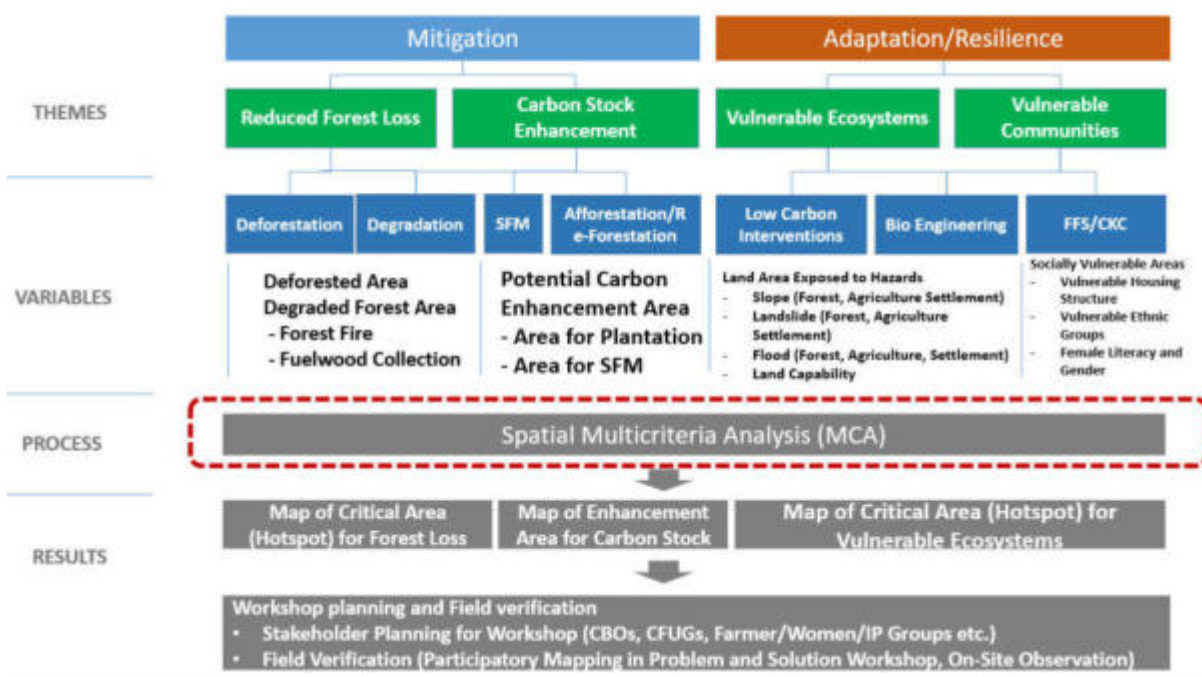


Figure 4: Multi-criteria analysis

2.3 Local Stakeholder Consultation

2.3.1 Selection of Participants

The selection process of participants for the two consecutive workshops i.e. Problem Analysis and Solution Analysis was vital for the validity and quality of CERP process. The selection process was carried out in collaboration with Division Forest Office (DFO) of Udayapur district. The selection process prioritized to include women and women lead organizations including Indigenous Peoples and their institutions at the river system level. The DFO informed respective sub-division offices to support in selecting participants, who are well informed about the issues of River System. Similarly, the study team coordinated with local government (*Palikas* and wards) to trace out the representatives who are directly associated with the agriculture and disaster issues. The participants were from Community Forest User Groups, Farmers Group, Agriculture Cooperatives and Belaka Municipality Office while considering social inclusion i.e. representatives from women, poor, Indigenous Peoples (IPs) and Dalits. There were 20 participants in total. Among the participants, 17 were from IP groups and altogether 7 females and 13 males (Annex 2).

2.3.2 Workshop

The two-day workshop was organized on 10 and 11 January 2022 at Mainamaini, Belaka-7, Udayapur. The day one of the workshop was focused to prepare problem tree while day two was dedicated to develop solution tree as per the problem tree developed in day one.

A. Problem Analysis (Day One)

The workshop facilitators firstly briefed about introduction of the BRCRN and the objectives of the workshop. This session was followed by the discussion on the topics of 'Climate Change Mitigation' and 'Climate Change Adaptation'. The aim of this session was to bring common understanding among the participants, facilitators regarding the concept of 'Climate Change Mitigation' and 'Climate Change Adaptation' that would be instrumental to bring clear, and precise local issues associated with River System. This was robust basis to design intervention packages for the BRCRN.

The participants were divided into two groups viz. 'Climate Change Mitigation (CCM)' and 'Climate Change Adaptation-(CCA)'. Each group nominated their spokespersons for the documentation of thematic issues and women were encouraged to be a spokesperson. Adding to this, CCM group was requested to discuss on the issues of deforestation, forests degradation and enhancement activities whereas CCA group was focused on the issues of agriculture and disaster. Both the groups were oriented on how problem and solution trees were to be formulated. They were asked to identify the key problem, direct and underlying causes of the problem and impacts of problem. The participants were also oriented about mapping of hotspots for interventions. For this map of the river system, overlaying boundary and satellite image were displayed through projector. Printed maps were also used for orientation. Participants were oriented about the features of maps like forest area, cultivation land, river/streams, roads etc.

All issues of four thematic areas (deforestation, forest degradation, agriculture and disaster) were documented in the meta cards. Meta cards were displayed in walls of the workshop hall. Meta card with key problem/challenge was attached at the top. Following it, meta cards with direct drivers were attached and then meta cards with underlying causes at the bottom to prepare a problem tree.

- **Group Exchange**

The problem trees prepared by each groups were displayed and group exchange was done for verification and inputs. The spokespersons of respective CCM and CCA groups were assigned to present their problem trees. During the presentation, CCM groups received inputs from participants of

CCA groups and vice versa. This process provided ample space to refine the local issues on case to case basis mutually.

B. Solution Analysis (Day Two)

On the second day, same participants were asked to remain in their respective groups of CCM and CCA. As informed them on the day before each group was asked to prescribe solutions of respective issues identified in problem analysis. They were asked to identify activities against problems, output of the activities, outcomes and finally impacts. The facilitators played same role as in problem analysis. All solutions were documented in the meta cards and displayed for the group exchange. Meta card with outcomes was pasted at the top followed by outputs and activities at the bottom to develop a solution tree.

- **Group Exchange**

The group exchange processes were carried out same as in Day One.

2.3.3 Identifying and Mapping of Hotspots

In the problem analysis day, the map of River System was displayed in both hardcopy and power point presentation including interactive Google Earth Images and carried out participatory discussion to identify hotspots of the respective River System (RS). These participatory discussions were instrumental to trace out the hotspots in terms of their severity, which would be basis for designing intervention packages for the BRCRN project with reference to climate change mitigation and climate change adaptation discussed in the problem analysis and solution analysis. The study team noted the name and physical location of the hotspots identified by the participants for field verification.

2.3.4 Field Visit and Focus Group Discussions (FGDs)

The study team went to field after the two-day workshops to verify identified hotspots. Maps and checklists were used for field verifications of hotspots. The study team had also conducted key informants interview to understand the depth of the problems in the respective hotspots. The study team discussed with local people on the major problems of the hotspots and rationale interventions to address the problems along with the local safeguard information. Indigenous people (IPs), Dalits social groups, and women were focused in consultations for inclusiveness, customary practices, norms, values and existing indigenous institutions, their roles in community and encourage them for their meaningful participation and insist them to be vocal on their problems in the face of climate change mitigation and climate change adaptation. The study team documented all the issues raised in field consultations, which would be reflected in the CERP.

2.4 Expert Planning Workshop

2.4.1 Expert Planning Workshop Participants

The experts from Division Forest Offices, Sub-division Forest Offices from respective river systems, Province Forest Directorate, Ministry of Forest Environment and Soil Conservation, Koshi Basin Management Center, President Chure Terai Madesh Conservation Development Board, Soil and Water Management Office, and Agriculture Development Center participated in the two-day workshops. Experts were invited in collaboration with BRCRN-PPMU and FAO-TA and Province ministries. All participants were informed though formal letter from Ministry of Agriculture and Ministry of Forest, Environment and Soil Conservation.

2.4.2 Workshop

The two-day expert planning workshop was conducted at Gaighat of Udayapur district on 21st and 22 August 2022. The workshop was conducted for Tawa South, Adheri-Baruwa-Dwar, Gidari and Sunkoshi river systems of Udayapur district. The workshop was intended to validate the preliminary CERPs

prepared from local stakeholder consultations. In the workshop, BRCRN-PPMU firstly briefed about introduction of the BRCRN project and objectives of the study. This session also included study process followed. In the workshop, detailed outcome derived from problem analysis, solution analysis and hotspot verification were shared. Issue related with deforestation, forest degradation, agriculture and disaster raised in local stakeholder workshops were shared with respective experts. Problem tree, Solution tree, Hotspot map, intervention packages, activities, safeguard analysis matrix, benefit enhancement activities were shared and discussed/verified in the workshop for individual river system. Comments and suggestions collected from the workshops are incorporated in relevant sections for improvement of the Critical Ecosystem Restoration Plan.

CHAPTER 3 : INTRODUCTION TO SUNKOSHI RIVER SYSTEM

3.1 Physiography, Land Cover and Hydrology

Sunkoshi river system lies north to Gideri river system. It is extended over 26.920759° to 26.861168°N and 86.960268° to 87.178281°E and constitute of north facing hillslope that is extended to Sunkoshi River.

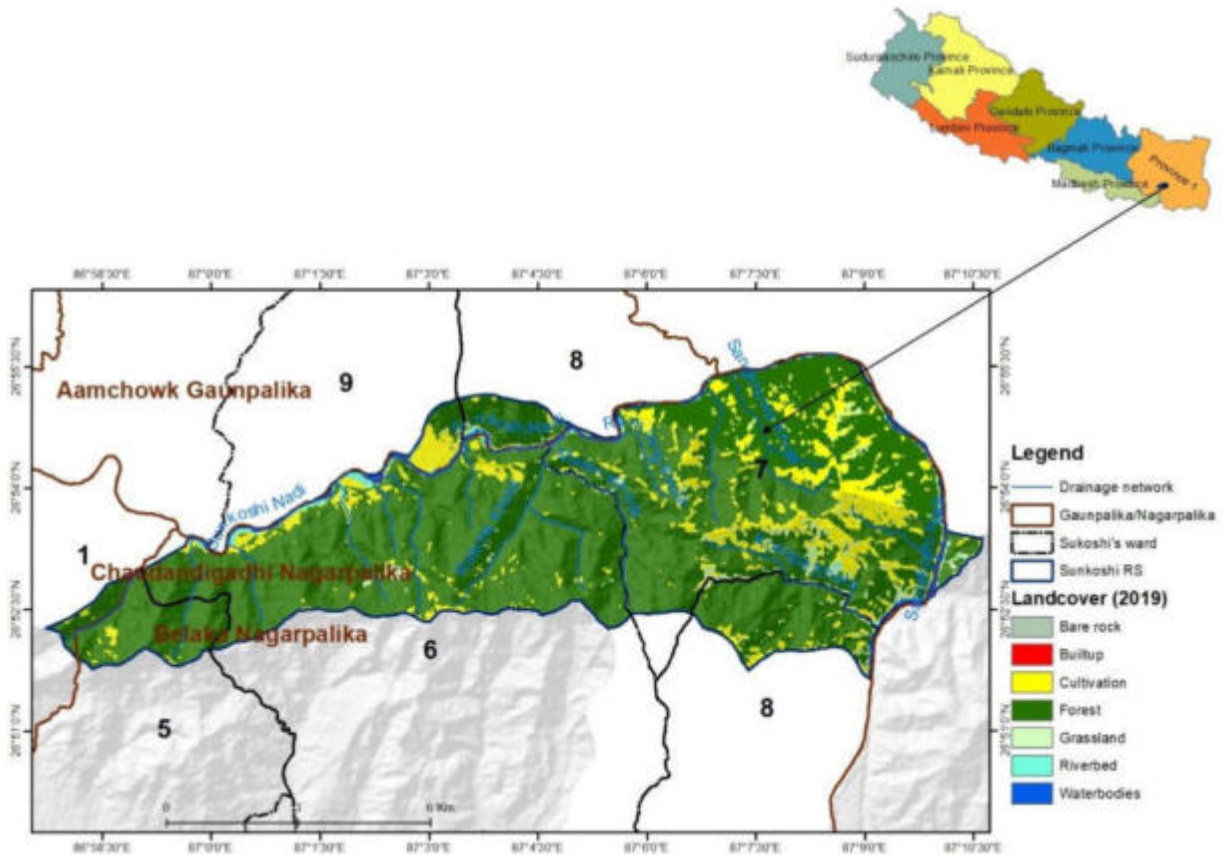


Figure 5: Location of Sunkoshi river system

Middle Siwalik is the main lithology of this RS, which comprises higher proportion of sandstone in a sequence of interbedded sandstone and mudstone. Sharp topography with high relief, steep slopes and escarpments are formed on the Middle Siwaliks, which is attributed to a higher proportion of beds of thick massive hard and resistant sandstones. This RS lies on tectonically active zone as it is bordered by Main Boundary Thrust and Marin Khola Thrust from north and south respectively.

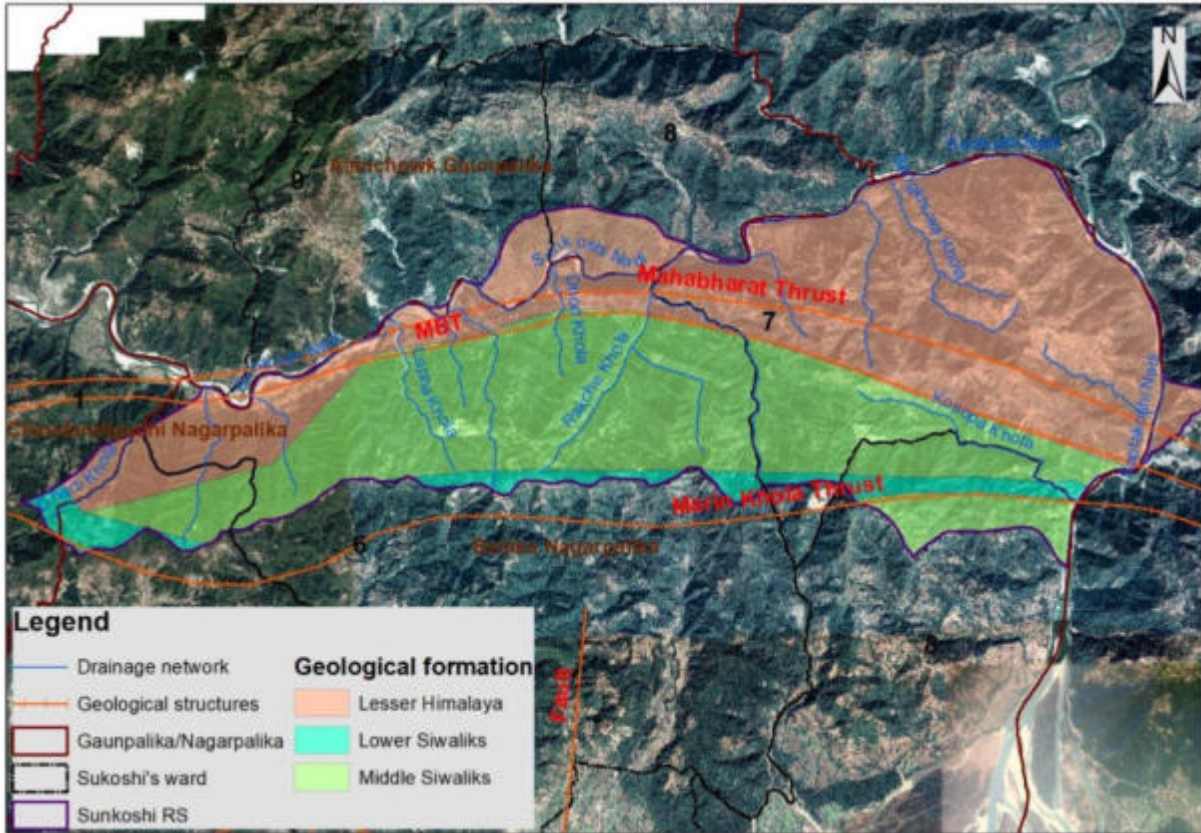


Figure 6: Geology of Sunkoshi river system

Forest¹ is the dominant land cover of RS, covering 82.5% of total area, which has been increased by 91.0 ha at the annual rate of 0.08% during 2000-2019. Population within the RS is in decreasing trend due to the fact that out-migration exceeded over in-migration as well as natural growth. This is why several patches of cultivated land have been abandoned. Few patches of such land have been converted into forest through natural succession.

Table 2: Land cover change in Sunkoshi river system

| Land cover | 2000 | | 2019 | | Change area (ha) | Rate of Change (%/yr) |
|-------------|-----------|----------------|-----------|----------------|------------------|-----------------------|
| | Area (ha) | Percentage (%) | Area (ha) | Percentage (%) | | |
| Built-up | 0.6 | 0.0 | 0.6 | 0.0 | 0.1 | 0.71 |
| Cultivation | 872.8 | 12.6 | 804.0 | 11.6 | -68.9 | -0.43 |
| Forest | 5608.3 | 81.2 | 5699.4 | 82.5 | 91.0 | 0.08 |
| Grassland | 230.3 | 3.3 | 212.2 | 3.1 | -18.1 | -0.43 |

¹ Land with tree crown cover of more than 10 percent and area covering more than 0.5 ha, with minimum height of the trees to be 5 m at maturity and in-situ conditions. The land may consist either of closed forest formations where trees of various storied and undergrowth cover a high proportion of the ground, or of open forest formations with a continuous vegetation cover in which tree crown cover exceeds 10 percent.

| | | | | | | |
|--------------|-------|-----|-------|-----|------|-------|
| Water bodies | 119.1 | 1.7 | 124.0 | 1.8 | 4.9 | 0.21 |
| Riverbed | 74.9 | 1.1 | 65.9 | 1.0 | -9.1 | -0.68 |

Source: (ICIMOD & FRTC, 2021)

3.2 Climatic Conditions

The RS has subtropical climate and is heavily influenced by the monsoon (June-September), with an average annual rainfall of 2159.7 mm (Table 3). The temperature ranges from 5 to 35^o Celsius.

Table 3: Rainfall distribution in Sunkoshi river system

| Station | Average long-term rainfall (mm) | | |
|--------------|---------------------------------|---------|------------------|
| | Annual | Monsoon | Maximum 24 hours |
| Tribeni | 1770.0 | 1447 | 403 |
| Barakhshetra | 2539.2 | 2163.3 | 405.3 |
| Chatara | 2169.6 | 1767 | 348 |

Source: (DHM, 2021)

Moreover, climate change scenarios analysis performed for National Adaptation Plan (NAP) process indicated that average annual mean temperature of Udayapur district is likely to rise, Representative Concentration Pathway (RCP) 4.5 projected that increased by 0.81^oC and 1.17^oC in medium-term and long term respectively. The highest rates of mean temperature increase are expected for the post-monsoon season followed by the winter season (MoFE, 2019). Rising temperature further will create the water stress during the dry months through decreasing the agricultural production and thereby increasing food insecurity. Increasing temperature is also likely to contribute for spread of the crop diseases, insects and pest, weeds and alien invasive (Pandey, 2012; Bhandari et al., 2019).

Table 4: Climate change scenario in Sunkoshi river system

| Temperature | °C | Change (°C) | | | |
|---------------|------------------------------|-------------------------|-----------------------|-------------------------|-----------------------|
| | RCP 4.5 | RCP 4.5 | | RCP 8.5 | |
| | Reference Period (1981-2010) | Medium Term (2016-2045) | Long Term (2036-2065) | Medium Term (2016-2045) | Long Term (2036-2065) |
| | 19.9 | 0.81 | 1.17 | 1.02 | 1.72 |
| Precipitation | mm | Change (%) | | | |
| | RCP 4.5 | RCP 4.5 | | RCP 8.5 | |
| | Reference Period (1981-2010) | Medium Term (2016-2045) | Long Term (2036-2065) | Medium Term (2016-2045) | Long Term (2036-2065) |
| | 1653 | 3.37 | 4.58 | 3.55 | 7.93 |

Source: (MoFE et al., 2019)

Similarly, average annual precipitation is likely to change in both the medium-term and long-term periods. It is likely to increase by 4.58% and 7.93% in the long period based on RCP 4.5 and RCP 8.5 respectively.

Local villagers perceived that rainfall duration has been shifted during last 30 years. Even in monsoon prolonged dry period are experienced in recent year. These severely hit the places like Bilimla, Harkha, Rusten, Mulgaun, Barigaun and others where water availability are naturally low.

3.3 Socio-ecological Process

Sunkoshi river system lies in the remote part of Udayapur districts, where accessibility is very limited. According to local stakeholders, more than 85% residences in RS are belonging to Indigenous groups. The ever increasing out migration causing labor shortage, leading to uncultured on more than 500 ha of cultivation land. Such land can be leased to needy farmers belonging to marginalized communities and women groups. The Belaka municipality has already adopted the modality for improving livelihoods of Musahar families (MoFE, 2020).

Traditionally, villagers are also using the steeper or marginal land (land having slope greater than 30 degree) as well to farm legumes. Legumes together with turmeric and ginger are main sources of income for farmers. Turmeric of this region is very popular; however, farmers are not getting enough benefit due to the lack of pre-processing and marketing knowledge and techniques. Besides these, Amriso (*Thysanolaena maxima*), Kagati (*Citrus aurantifolia*) and Orange are other crops that peoples are interested.

CHAPTER 4 : PROBLEM AND SOLUTION ANALYSIS

4.1 Problem Analysis

Theme I: Climate Change Mitigation

4.1.1 Drivers and Underlying Causes of Deforestation and Forest Degradation

The major challenges of the forest sector identified at Sunkoshi River System are deforestation and forest degradation. Causes of deforestation and forest degradation are usefully separated into direct drivers and underlying causes. Drivers of D&FD are mostly associated with anthropogenic activities.

The drivers are prioritized and presented in sequential order in Table 5.

Table 5: Direct drivers and underlying causes of deforestation and forest degradation

| Drivers of D&FD | Underlying Causes | |
|--|---|---|
| Unsustainable harvesting and illegal logging | Poverty and limited livelihood opportunities | Forest products being a source of income generation to poor/marginalized |
| | Higher dependency in firewood | Insufficient efforts from concerned agencies to promote alternative energy sources |
| | Illegal logging as income sources | Forest users not afraid of/dominance over CFUGs' executive committees; Collaboration of CFUGs' committee member, local politician, illegal loggers (in some cases); Use of waterways (Saptakoshi River) for transport |
| | Insufficient fodder and firewood in private lands | Small land holdings |
| Encroachment of forestland | Poverty and limited livelihood opportunities | Agriculture land expansion; shifting cultivation (Khoriya Phadani) |
| | Unmanaged settlers/settlements | Land tenure issues; Ineffective law enforcement |
| Open and uncontrolled grazing | Inadequate fodder production in private lands | Small landholdings; Insufficient fodder, grasses in dry season |
| | Ineffective law enforcement | Inability to implement penalty, punishment from CFUGs |
| Forest fire | Lack of awareness | |
| | Carelessness from herders and forest dwellers | Throwing of cigarette butts etc. |
| | Intentional fire | Intentions of poaching, grass improvement |

| Drivers of D&FD | Underlying Causes | |
|---|--|--|
| Ineffective forest management practices | Inadequate financial and technical capacity of CFUGs | Low income of CFUGs; Low support from concerned agencies; Outdated forest management operation plan |
| | Poor forest enhancement | Impact on natural regeneration due to forest fire, open grazing, and fodder and firewood collectors; Inadequate supply of saplings of demanded species; Higher cost of transport for seedlings |
| | Weak governance | Declining accountability of CFUG members; Deficiency in forest sector transparency |
| Infrastructure development | Disproportionate population distribution | Construction of roads to serve scattered settlements and market access for agriculture products |
| Erosion/landslide | Natural causes | Fragile geological condition and slope terrain; High intensity rainfall and continuous rainfall for several days |
| | Shifting cultivation (Khoriya phadani) | Limited productive land for the community |
| | Road construction; use of heavy machineries | Road construction without adopting engineering study and design |

❖ Problem Analysis

The findings from local stakeholder consultations and expert consultations indicate that unsustainable/illegal harvesting of forest products, open/uncontrolled grazing, forest fire, encroachment of forestlands and infrastructure development are the major drivers of deforestation and forest degradation in Sunkoshi River System. Erosion/landslide is other drivers of forest loss and degradation. Ineffective forest management practices also contribute to forest degradation.

Direct drivers of deforestation and forest degradation are the results of several underlying causes. The major underlying causes are high forest dependency; poverty and limited livelihood opportunities; ineffective forestry sector governance; weak law enforcement; lack of sustainable forest management; financial and human resource constraints in CFUGs and forest offices; and weak coordination and cooperation among concerned agencies.

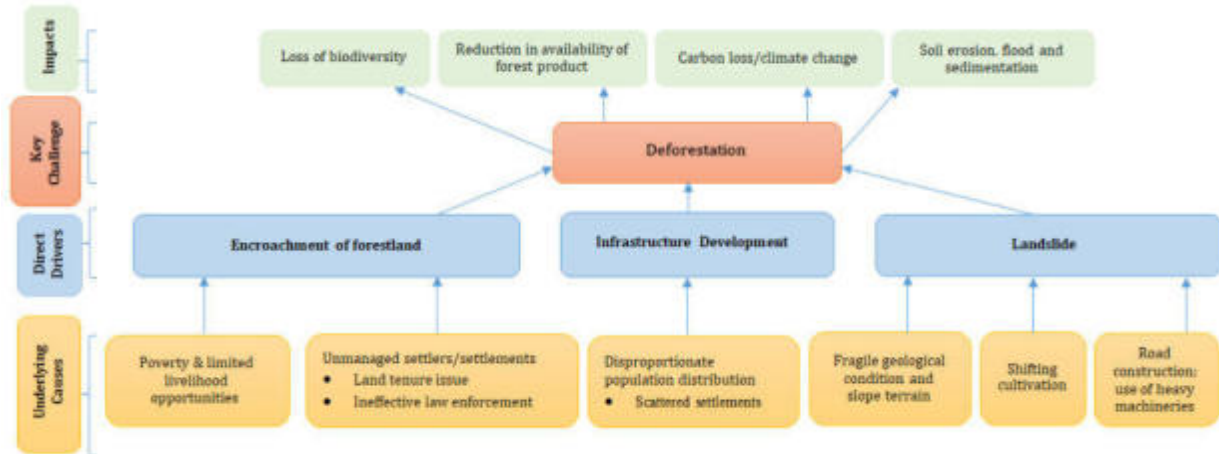


Figure 7: Problem tree for deforestation

Deforestation and forest degradation are related to climate change and pose threats to biodiversity and livelihood of forest dependent local communities. Deforestation refers to complete loss of forest cover. One of the major drivers is encroachment of forestlands for agriculture land and settlement expansion. Agricultural expansion can be further categorized into permanent conversion of forestland to farmland, and shifting cultivation. The underlying causes are limited livelihood options of households and unmanaged settlers (land tenure issues) near to forest areas. Nowadays, in community forests, encroachment is minimal due to regular monitoring of forests by local community forest user groups. Any expansion is limited to minor shifting of boundaries into forestland at some locations. Infrastructure development in forest area is found to be other driver of forest loss. Unplanned and unregulated opening of road tracks to serve scattered settlements is other cause of forest loss. Landslide triggered by both human-induced and natural factors also cause forest loss. Inappropriate land use practices are main human-induced causes; and heavy/erratic rainfalls, steep slopes and other topographic conditions are the major natural causes (Figure 7).

Forest degradation relates to loss of biomass (carbon) and reduction in the capacity of forests to produce ecosystem services. Unsustainable and illegal harvesting is one of the drivers of forest degradation. Harvesting of forest products comprise felling of trees and saplings (mostly illegally) for timber and poles, firewood collection for household use and sale, and repeated and unsustainable harvesting of fodder. Unemployment has motivated many people for illegal collection of timber for sale. Open and uncontrolled grazing negatively affects natural regeneration and growth of seedlings and ultimately causes forest degradation. People are dependent on forests for grazing due to lack of specified grazing lands, inadequate fodder production in private lands and lower financial capacity to shift to stall feeding. Forest fire damages and hinders regeneration, seedling growth and destroys non-timber forest products under lower strata of forest floor. It is also believed to trigger soil erosion due to the destruction of natural vegetation. Forest fire is caused either due to careless handling of fire by forest dwellers and herders or intentionally by poachers for hunting and local communities for grass improvement. The spread of forest fire has been difficult to handle due to inadequate trained human resources and firefighting equipment.

Ineffective forest management practice is also one of the drivers of forest degradation. It is mainly associated with institutional weakness caused by lower financial capacity and technical resources; poor forest enhancement; and weak forest governance due to deficiency in forest sector transparency, declining accountability, and weak coordination and cooperation among forest stakeholders (Figure 8).

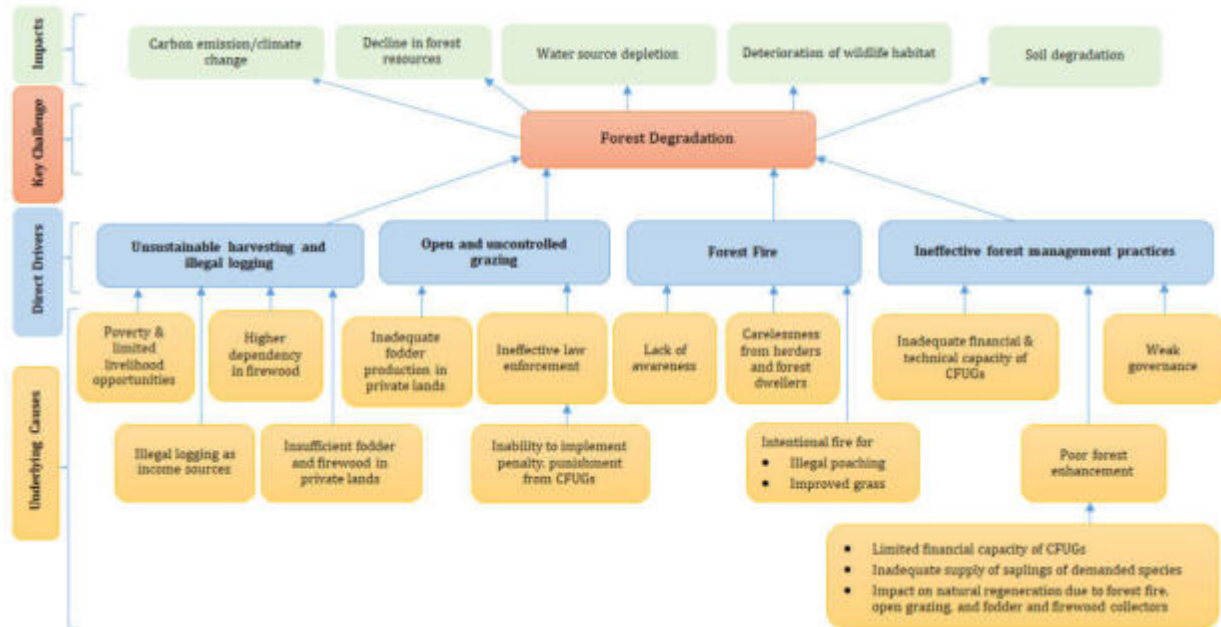


Figure 8: Problem tree for forest degradation

❖ **Key Observations**

- An elite influence in CFUGs is one of the major causes of weak governance. Persons holding major posts in executive committees of CFUGs resign once they find better opportunities. The other reason is competitive feelings where one who does not get hold on major posts files complaints against others to hinder his/her work.
- The major cause behind illegal logging is unemployment. The other cause is unregistered lands. The households with unregistered lands are deprived of timbers distributed from District Forest Products Supply Committee (DFPSC). It also creates difficulties in private land forests, as sell of forest products from unregistered lands is illegal.
- At present, timbers are distributed from District Forest Products Supply Committee, which is also causing demand-supply gap. Distant users are unwilling to buy from DFPSC due to additional cost of transportation.
- Women, IPs, Dalits, poor and marginalized groups not having access to finance, technology and skill to address the deforestation problems and policy gaps in addressing gender governance.
- Women are not able to ask for their equal rights to natural resources management. Women and marginalized groups not having adequate knowledge and awareness in policies and law for sustainable forest management.
- Not having sufficient alternative energy programs. Traditional use of energy sources and inadequate alternative energy programs to reduce drudgery of women.

Theme 2: Climate Change Adaptation

4.1.2 Drivers and Underlying Causes of Vulnerable Ecosystem and Community

Climate induced disaster and climate stress on agriculture productivity are two key challenges representing vulnerable ecosystem and local community in Sunkoshi River System. These two key issues have impacts on the ecosystem and livelihood generation through damage to natural vegetation, loss and damage of agricultural lands, loss of life and properties, low family income and food insecurity.

The drivers are prioritized and presented in sequential order in Table 6.

Table 6: Direct drivers and underlying causes of vulnerable ecosystem and community

| Drivers | Underlying Causes | |
|---|---|--|
| Climate Induced Disaster | | |
| Erosion/landslide | Topography | Fragile geological condition and slope terrain; dry land |
| | Forest degradation | |
| | Heavy/erratic rainfall | High intensity rainfall and continuous rainfall for several days |
| | Infrastructure development | Use of heavy machineries for road construction |
| | Shifting cultivation (Khoriya Phadani) | Inappropriate agriculture practice in slope lands; Limited productive lands for the community |
| Weak disaster risk management | Inadequate capacity and coordination | Insufficient investments and efforts in identification of vulnerable areas and Disaster Risk Reduction |
| | Settlements in vulnerable areas | Poverty (landholdings in vulnerable area only); risk acceptance |
| Climate Stress on Agriculture Productivity | | |
| Inadequate capacity and resources | Limited farm skill and technology use | Lack of agriculture mechanization and technology adoption |
| | Low investment capacity of farmers | Inadequate promotional activities and accountability of farmers |
| | Unavailability of seeds on time | |
| | Poor market access and infrastructures | Lack of processing and storage facilities; Inadequate transport facilities |
| Agriculture yield loss | Crop pests and diseases | Inadequate knowledge and skill to cope with pests and diseases; Low investment capacity and dependency on government support to cope with pests and diseases |
| | Crop depredation by wildlife in the field | |
| Insufficient irrigation | Limited surface water sources/ dry area | |
| | Inadequate efforts to promote alternative irrigation technologies | Rainwater harvesting, drip irrigation and others |

| Drivers | Underlying Causes | |
|---------|--|--|
| | Inadequate knowledge and skill on dry area resilient crops | |

❖ **Problem Analysis**

Erosion/landslide and weak disaster risk management are major drivers of climate induced disaster that enhances ecosystem and local community vulnerability. Erosion/landslides have caused loss and damage of natural vegetation, agricultural land and properties affecting local people’s livelihood. It is triggered by both natural and anthropogenic causes. Inappropriate land use practices like cultivation in slope lands, forest degradation, and unplanned and unregulated road construction are main human-induced causes. Heavy/erratic rainfalls, steep slopes and other topographic conditions are major natural causes. Weak disaster risk management has further exacerbated exposure to these disasters. The reasons behind this are weak coordination and collaboration among concerned sectors and ineffective Disaster Risk Reduction (DRR) policy and planning. The investments in DRR are inadequate and scattered without proper planning (Figure 9).

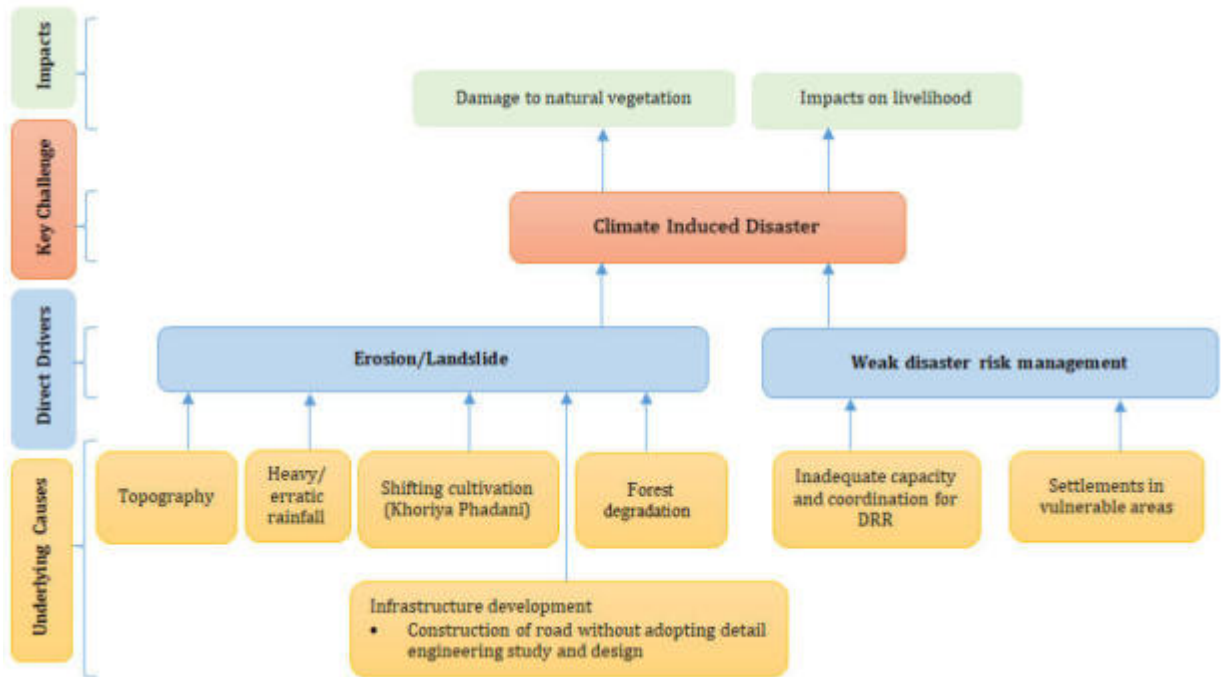


Figure 9: Problem tree for climate induced disaster

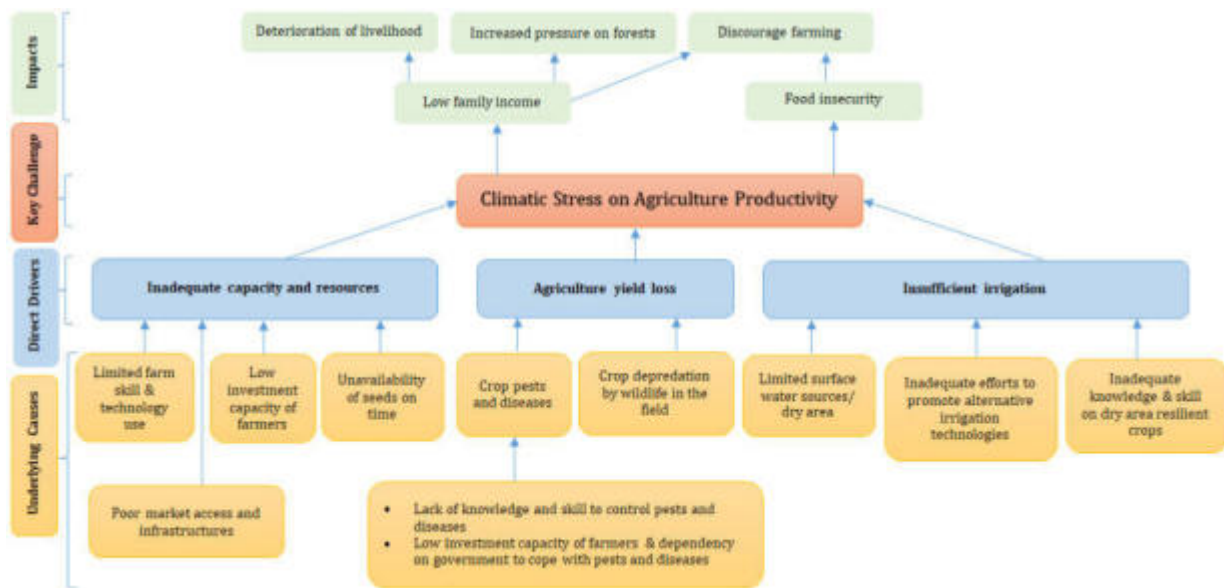


Figure 10: Problem tree for climate stress on agriculture productivity

Climate stress on agriculture productivity is the other aspect of vulnerable communities. It has direct impact on people’s livelihood through low family income and food insecurity. It eventually makes forest ecosystem vulnerable through increased pressure in forest resources. The major drivers are inadequate farm skills and financial resources; insufficient irrigation; and pests and diseases. Farmers have limited skill for commercial and climate resilient farming practices. There is less use of technology and equipment to enhance agriculture productivity. Irrigation facilities are not sufficient. Investment capacity of small farmers is low due to poor financial status. Government support is inadequate. One of the major problems is unregistered lands that make difficult in receiving bank loans. Lack of agriculture technician at local level and inadequate promotional programs (incentives, subsidies, farm equipment support) are other problems in agriculture sector. Moreover, poor market access and infrastructures; higher cost of production; and low market price of sale of products due to market domination by intermediaries have demotivated farmers to adopt commercial agriculture (Figure 10).

❖ **Key Observations**

- Security institutions (Nepal Army, Nepal Police, and Armed Police Force) are more involved in disaster management but they lack essential equipment.
- Unregistered lands make difficult for households to receive government incentives in farming.
- Though declared at policy level, provision of crop insurance is yet to be endorsed.
- Hybrid varieties are less pest resilient both in cultivation and storage.
- Farmers face unnecessary hurdles in registration of farmers group, acquisition of PAN number, approval for government incentives, auditing and renewals.
- Gendered governance, participation and integration was found to be low in all the issues and their voices are not heard or skills and technological access weak.
- Women not having land titles and illegal settlement do not allow women, IPs or marginalized communities to get benefits from the project interventions. For example illegal settlers can have access or benefits from subsidies and other project interventions.

4.1.3 GESI Issues Observed in Problem Analysis

Women, IPs, Dalits, poor and marginalized groups have less access to finance, technology and skill to address the deforestation problems and policy gaps in addressing gender governance. Women are not

able to ask for their equal rights to natural resources management. Women and marginalized groups are not having adequate knowledge and awareness in policies and law for sustainable forest management. Gendered governance, participation and integration was found to be low in all the issues and their voices are not heard or skills and technological access is weak. Settlements with unregistered lands do not allow women, IPs or marginalized communities to get benefits from the project interventions.

The GESI issues identified from problem analysis are presented in Table 7.

Table 7: Problems associated with GESI

| Drivers | Underlying Causes | |
|--|--|---|
| <p>Inadequate exercise of gender-inclusive governance in climate change, sustainable natural resource management (SNRM) practice</p> | <ul style="list-style-type: none"> • Male- supremacy and dominance in decisions • Limited access of women to information and communication (especially climate change and SNRM-related information, facility, fund, notice, and subsidies) • Less consultation with women regarding agenda and time of meetings • Unavailability of disaggregated data • Lack of recognition of traditional knowledge of women in climate resilient land use practices (CRLUP)/SNRM • Articulation of CRLUP/SNRM /DRR as scientifically complex subjects • Limited knowledge on gender mainstreaming approach and value among officers/key people • Gendered power relations within households, society and restricted mobility of women | <ul style="list-style-type: none"> • Hesitation to speak in meeting • Less knowledge on CFUG management • Less knowledge on climate change adaption • Insufficient women participation • Increased vulnerability of women towards environmental changes • Slower women leadership development in natural resource management (NRM), forest management and DRR • Low income of women • Less control of women over high value forest products |

4.2 Solution Analysis

Theme I: Climate Change Mitigation

4.2.1 Activities for Reducing Forest Loss and Enhancing Forest Density

Various activities have been identified for reducing forest loss and enhancing forest density and enrichment. The activities are proposed to mitigate deforestation and forest degradation by providing solutions to direct and underlying drivers. The strategic actions include reducing forest dependency by addressing poverty and livelihood issues; promoting agroforestry and livestock management; strengthening forest fire control system; controlling open grazing; improving law enforcement and overall forestry sector governance; promoting sustainable forest management; controlling further encroachment of forestlands; and capacity enhancement of user groups and government forestry staffs. Afforestation and reforestation activities are proposed to enhance forest density (Table 8).

Table 8: Activities for reducing forest loss and enhancing forest density

| Drivers of D&FD | Activities against Drivers | |
|--|---|--|
| Unsustainable harvesting and illegal logging | Enhance income generation opportunities of poor/marginalized forest users | Skill development trainings for socially and economically marginalized groups including women, IPs and Dalits |
| | Strengthen forest management and law enforcement | Mobilize informants with provision of awards/recognition; Strengthen communication and coordination with concerned agencies (forest offices) for effective actions; Provision of strong punishments, penalties or suspension from CFUG if members are involved |
| | Establish on-farm tree nursery | Production of fodder, grass seedlings in on-farm nursery and distribution |
| | Promote agroforestry | Promote multi-year, high value plant species in agroforestry |
| Encroachment of forestland | Forest boundary demarcation | Technical and financial support to DFOs/sub-DFOs |
| | Enhance income generation opportunities poor/marginalized forest users | Skill development trainings and employment generation for poor and marginalized groups |
| | Resolving land ownership issues | Policy commitments/Policy interventions |
| Open and uncontrolled grazing | Promote stall feeding | Training and support on commercial livestock farming and shed improvement |
| | Support fodder banks in private and public lands | Distribution of seeds/seedlings of fodder trees and nutrient grasses; technical trainings |
| Forest fire | Sensitization/awareness programs | Sensitize communities on the impacts of forest fire on ecosystem functions/services and their restoration; Implement activities to control illegal poaching |
| | Firefighter training and support firefighting equipment to CFUGs | Capacity development and funding support for fire line construction |
| | Removal of dry biomass | Promote compost production from dry leaf litters and unwanted bushes |

| Drivers of D&FD | Activities against Drivers | |
|---|--|---|
| Ineffective forest management practices | Implementation of sustainable management of forest | Review/upgrade/renewal of forest operational plans (FOPs) of community forest user groups (CFUGs); Training on silvicultural operations and equipment use |
| | Establish multipurpose nurseries | Demand based seedlings production with priority on native species |
| | Implement forest enhancement activities | Enrichment plantation |
| | Strengthen forest governance | Joint coordination meeting of government staffs and CFUGs to enhance accountability and transparency |
| Infrastructure development | Regulate infrastructure development in forest area | Promote environment friendly infrastructures; IEE/EIA & detail engineering study and design prior infrastructure development |
| Erosion/landslide | Landslide treatment | |
| | Gully control | Integration of structural and non-structural measures in landslide/gully treatment |
| | Promote agroforestry in marginal lands | Promote high value/multiyear crops for agroforestry; Promote dry area resilient, erosion control and moisture retaining species |

❖ Solution Analysis

Solution trees are prepared to minimize deforestation and restore degraded forests. Deforestation is associated with encroachment of forestlands, infrastructure development and natural hazards. The foremost activity to control encroachment is to resolve land tenure issues. This requires intervention at policy level. Forest boundary demarcation also resolves land tenure issue and requires strong law enforcement to avoid further encroachment. Poverty and livelihood issues can be addressed by enhancing income generation opportunities for poor/marginalized groups through skill development training and forest based entrepreneurship. Infrastructure development in forest areas can be regulated through policy interventions; enhancing inter-agency coordination and cooperation; and provision of environment assessment (IEE/EIA), detail engineering study and designs. Infrastructures in forest areas should be environmentally friendly. Forest loss from landslide can be minimized through landslide treatment, gully/debris torrent control and agroforestry in marginal lands (Figure 11).

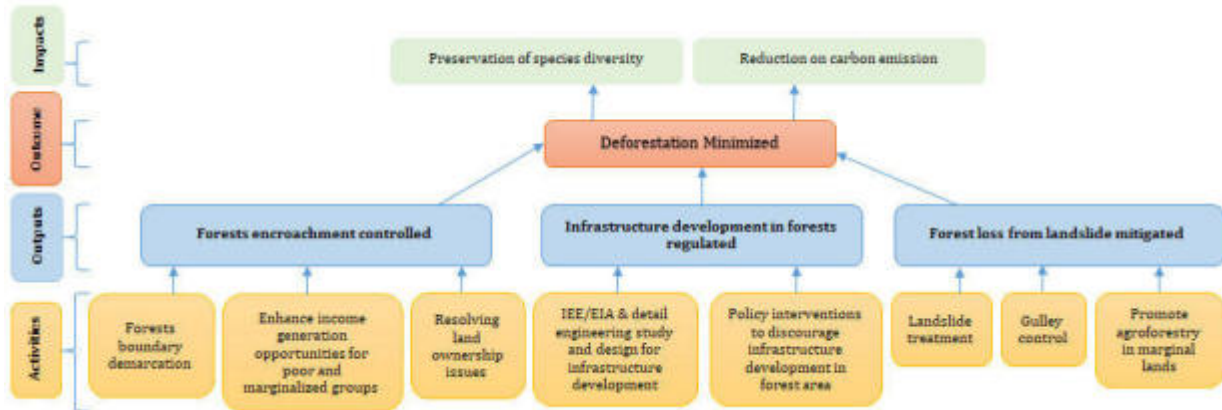


Figure 11: Solution tree for minimizing deforestation

Degraded forests can be restored through addressing of direct and underlying drivers of forest degradation, improving natural regeneration and plantations. Illegal harvesting of forest products can be minimized by enhancing income generation opportunities for poor/marginalized forest dependent people, strengthening forest management and law enforcement, and promoting agroforestry. The socially and economically marginalized forest dependent people can be provided with skill development programs and support for entrepreneurship development. Promotion of agroforestry requires seedlings and technical support. Fodder trees and nutrient grasses can be promoted in private and public lands. This enhances fodder availability outside forests and reduces pressure of open grazing in forests. Open grazing can also be controlled through livestock breed improvement and stall feeding. Providing training and support on commercial livestock farming and shed improvement can be helpful in promoting stall feeding. Forest fire can be mitigated by enhancing firefighting capacity and early preparations. The CFUGs need to be well trained and equipped to control forest fire. Periodic removal of dry biomass reduces forest fire spread. In turn, the bushes and dry leaf litters can be used for compost/manure production.

Forest management can be improved through FOP implementation and strengthening of sustainable forest management practices, implementation of forest enhancement activities and strengthening of forest sector governance. All the CFUGs should have a valid sustainable forest operational plan. They should be well trained and equipped for its implementation. Forest enhancement can be done through afforestation and reforestation. Seedling/sapling availability can be ensured by construction/upgradation of nurseries. Priority should be given to local native species while other commercial species can also be introduced through proper study and in line with safeguard measures. Nurseries should produce saplings of demand based species that will encourage plantation. Moreover, government staffs and CFUGs' executive committee members should be sensitized and capacitated to strengthen forest sector governance (Figure 12).

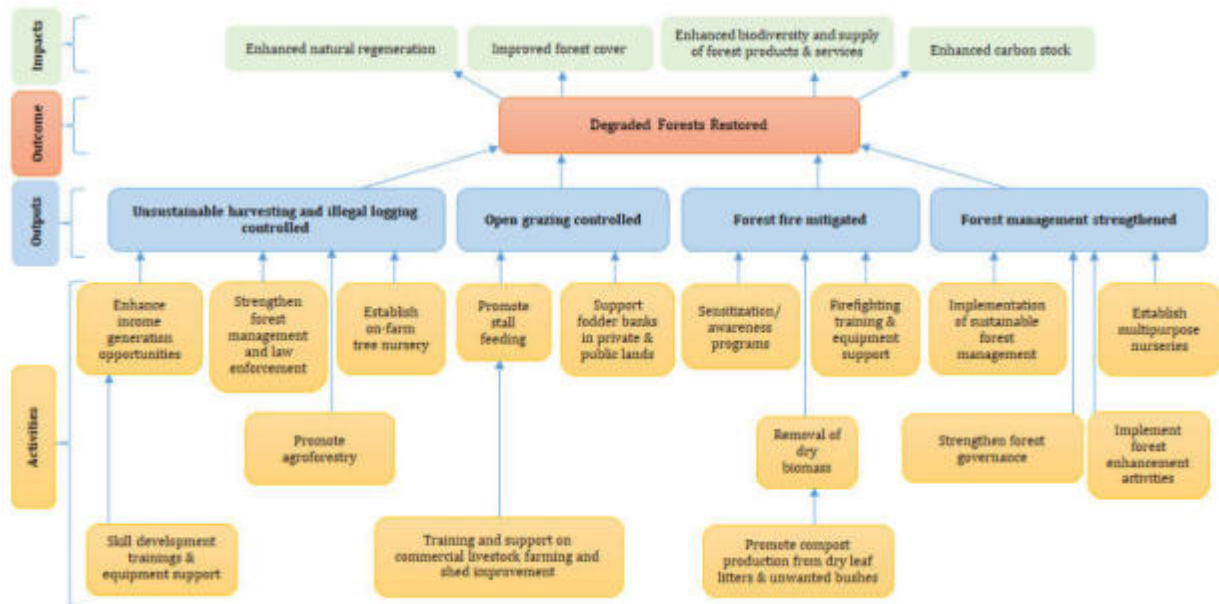


Figure 12: Solution tree for restoration of degraded forests

❖ **Major Activities and Outputs**

The major activities and outputs proposed for reducing forest loss and enhancing forest density are presented in Table 9.

Table 9: Major activities and outputs for reducing forest loss and enhancing forest density

| Major Activities | Outputs |
|--|--|
| Forest fire control | Restored degraded forests area halting forest fire, illegal harvesting and grazing |
| Agroforestry promotion | |
| Income source of poor/marginalized forest users enhanced halting illegal harvesting | Improved natural forest management |
| Improvement of forest cover within national forest through enrichment plantation/ANR | |
| Strengthening forest management | |

❖ **Recommendation from Expert Planning Workshop**

- It would be effective to enhance cooperation and collaboration with security agencies for forest fire management. They should be provided with essential equipment like fire extinguisher, fireproof jackets, water jet spray etc. Security agencies can also provide firefighting training.
- Timber distribution should be decentralized with provision of distribution from sub-division forest offices. It can be effective to reduce demand-supply gaps.

Theme 2: Climate Change Adaptation

4.2.2 Activities for Enhancing Adaptation/Resilience of Ecosystem and Community

Various activities are identified for disaster risk reduction, supporting climate resilient farming and enhancing agriculture productivity based on direct and underlying causes of vulnerable ecosystem and community. The activities are proposed to cope with these drivers and enhance adaptation/resiliency of ecosystem and local community (Table 10).

Table 10: Activities for enhancing adaptation/resilience building of ecosystem and community

| Drivers | Activities Against Drivers | |
|---|--|---|
| Climate Induced Disaster | | |
| Erosion/ landslide | Landslide treatment | Crown protection, drain management, seed broadcasting, check dam etc. |
| | Construction of check dams and bioengineering for gully protection | |
| | Promote agroforestry on marginal land | Plantation of high value/multi-year species- Amriso (<i>Thyrsanolaena maxima</i>), Bans (bamboo), Bhuikatahar (pineapple) and fodder trees and grasses |
| | Regulate infrastructure development | IEE/EIA & detail engineering study and design for road construction; Plantation of Amriso, Bans along the roads |
| | Promote slope agriculture technologies | Promote agriculture practices that supports erosion control |
| Weak disaster risk management | Identification of vulnerable areas | Participatory planning approach involving local, government, community and other concerned agencies |
| | Enhance coordination and collaboration for integrated DRR planning | Preparation of risk sensitive land use plan by local government and implementation |
| Climate Stress on Agriculture Productivity | | |
| Inadequate capacity and resources | Establish Farmer Field Schools to capacitate farmers | Training and incentives to promote climate resilient farming |
| | Incentives to promote commercial farming | Incentives based on training and technology |
| | Promote cooperative farming among small landholders | Support seed money, soft loans, subsidies in equipment, production based subsidies |
| | Establish collection, storage and processing facilities | Establishment of collection, storage and processing facilities for turmeric, lentils etc.; Trainings on processing, packaging and storage of agriculture products |
| | Promote leasehold farming in abandoned lands | Abandoned cultivation lands to be owned by local government and provision of leasing those lands to pro-poor farmers |

| Drivers | Activities Against Drivers | |
|-------------------------|---|---|
| Agriculture yield loss | Train farmers on identification and treatments of crop and livestock diseases | |
| | Promote conservation of resilient native crops and local livestock breeds | Trainings on seed production, selection, grading, storage; Improvement of local livestock breeds and crop varieties for climate resiliency and increased production |
| | Enhance food source of wild animals within forest area | Plantation of fruit bearing species like Amala (<i>Phyllanthus emblica</i>), Jamun (<i>Syzygium cumini</i>), Churi (<i>Diploknema butyracea</i>) etc. |
| Insufficient irrigation | Promote alternative irrigation practices | Training and support drip irrigation, rainwater harvesting, earthbag ponds etc. |
| | Water source conservation | Construction and rehabilitation of ponds (aahal) |
| | Promotion of on-farm water conservation agriculture practices | |

❖ Solution Analysis

The strategic actions proposed for disaster risk reduction are landslide treatment, erosion control, and strengthening disaster risk management. Landslide treatment can be done through crown protection, drain management, seed broadcasting etc. gullies/debris torrent can be treated by constructing check dams. To avoid erosion from human-induced causes like infrastructure development (road constructions) must be regulated. Promoting agroforestry, livestock management and conservation agriculture in slopy lands also help in reducing soil erosion. Plantation of high value species, multi-year plant species, fruits not only reduces erosion but also provides the source of income. Bioengineering can be integrated for effectiveness along with structural measures. It also enhances vegetation cover. The other important activity to minimize disaster risk is to enhance coordination and collaboration between different agencies working for disaster risk management. The disaster risk reduction plans of various agencies should be integrated that provides solution to inadequate and scattered investments thereby enhancing effectiveness of DRR activities. Local governments should be encouraged to prepare Risk Sensitive Land Use Plans and strengthen disaster preparedness. Disaster preparedness can also be strengthened through equipment support to concerned agencies (Figure 13).

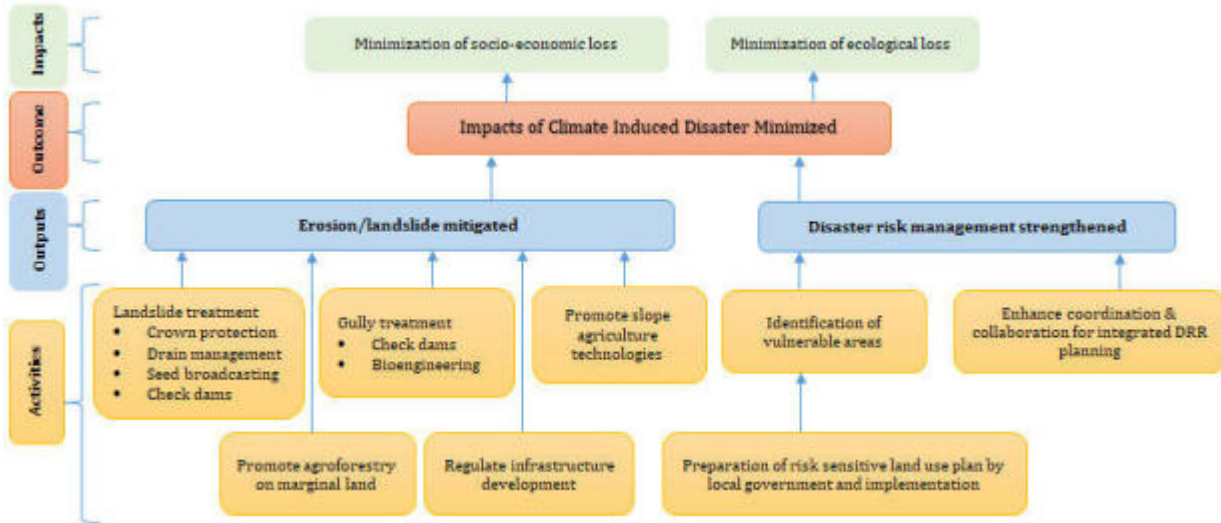


Figure 13: Solution tree for minimizing impacts of climate induced disasters

One of the important aspects of enhancing adaptation/resilience building of ecosystem and local community would be climate resilient farming practices and enhancing agricultural productivity. Increase in agriculture productivity will improve livelihood of small farmers and at the same time, it will decrease forest dependency. To achieve this, foremost priority should be to enhance capacity of farmers. Farmer Field Schools can be the best solution where farmers will be trained on climate resilient farming practices and enhancing agriculture productivity. Training farmers alone would not be sufficient to encourage farmers. Providing seed money, soft loans, subsidies in equipment, production based subsidies, and improving irrigation facilities can encourage farmers to commercial farming. Alternative irrigation practices like rainwater harvesting, drip irrigation can be promoted along with conservation of water sources to improve irrigation facilities. Farmers can be trained on identification and treatment of pests and diseases. Conservation of resilient native crops and local livestock breeds should be promoted. Improvement of native crop/livestock varieties can enhance resiliency and enhance productivity (Figure 14).

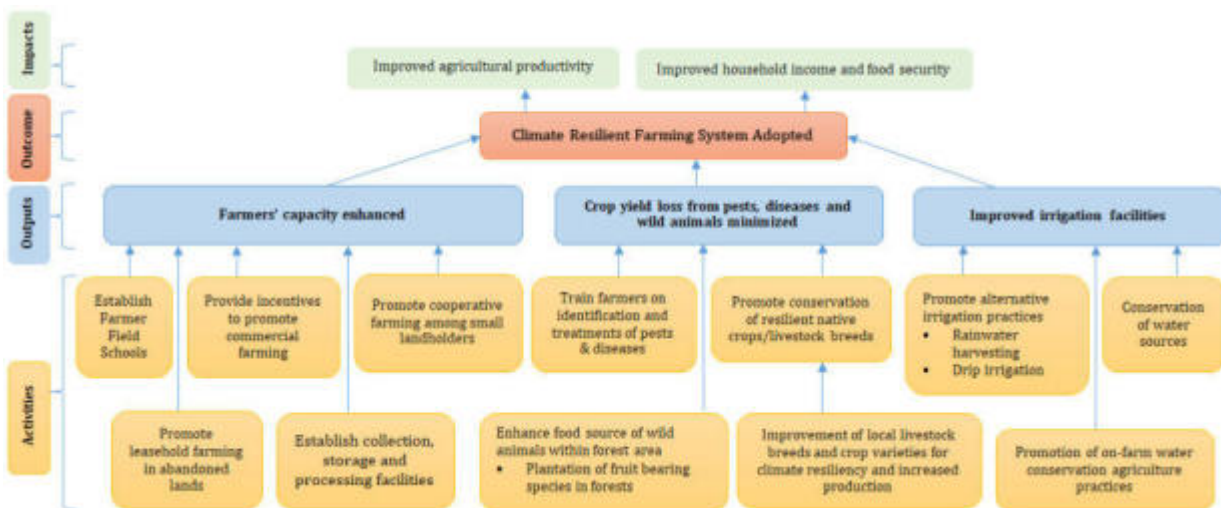


Figure 14: Solution tree for climate resilient farming practices

❖ Major Activities and Outputs

The major activities and outputs proposed for enhancing adaptation/resilience building of ecosystem and community are presented in Table 11.

Table 11: Major activities and outputs for enhancing adaptation/resilience building of ecosystem and community

| Major Activities | Outputs |
|--|--|
| Controlling erosion/landslide and management of sedimentation | Minimized impacts of climate induced disasters (erosion, landslides/ sedimentation and flooding) |
| Agroforestry promotion in marginal/sloping lands | |
| Strengthening disaster risk management and awareness creation on climate resilient NRM | |
| Establish and operationalize Farmers Field Schools (FFS) | Farmers adopted climate resilient farming practices |
| Implementation of climate-resilient land use practices | |

❖ Recommendation from Expert Planning Workshop

- Provide equipment support to security agencies for disaster management.
- Households with unregistered lands can receive government support for agriculture on recommendation from respective ward offices.
- Abandoned agricultural lands can be owned by local governments and lease those lands to underprivileged farmers for cultivation.
- Address gender inclusive governance which has been the weakness in addressing policy issues and practicing good governance.

4.2.3 Gender Inclusive Action Plan and Process

Gender inequality and social norms limit women's access to resources and sufficient opportunity to participate in the decision-making process, particularly in sustainable natural resource management. Women are playing a significant role in the conservation of forests and increasing the adaptability of climate change impact. The entire CERP process has adopted gender-inclusive actions such as ensuring equal participation during the consultation. The process adopted a gender-specific approach to collect problems, especially among women's user groups, through the Himalayan Grassroots Women's Natural Resource Management Association (HIMAWANTI). The gender-specific approach adopted particular research tools such as seasonal calendars, problem and solution community workshops, and focus group discussions among women, Dalits, IP's women, and other marginalized communities. Also, the consultation process includes a consultation with women and women lead organizations. The male leaders were also involved in advocating gender equality and women's engagement in the climate change planning process. The gender mainstreaming approach is included in problem and solution analysis and the recommendation has been incorporated in the plan. Key issues and solutions on gender equality in SNRM:

Table 12: Gender issues and gender inclusive actions

| Key issues | Solution |
|--|--|
| 1. Unequal representation and influence of women in NRM, CCA, and DRR governance | 1. Equal representation of women and consideration of specific adaptation needs is a must to realize inclusive SNRM and CCA |
| 2. Women's issues and capacity are not considered in the planning process | 2. Involvement and integrating women and women's concerns need to include in the programming process (planning, budgeting, monitoring, evaluation, and redesigning of the plans and project) |

| Key issues | Solution |
|--|---|
| 3. Women are just counted as vulnerable groups and passive beneficiaries of development interventions | 3. Plan/conduct gender mainstreaming training, learning events, and advocacy campaigning for gender integration for the government officers, CBOs executive, local resource persons, and other stakeholders |
| 4. Women are more involved in labour contributions both in conservation and management of natural resources | 4. Learning and sharing platforms for grassroots-level women at their settlements can help to identify their issues and problems in the group |
| 5. Women have less control over high-value products such as timber and the commercialization of non-timber forest products as compared to men | 5. Provide business opportunities, build the leadership skills to communicate or negotiate with men/leadership/decision makers to access information and resources and initiate entrepreneurship, promote men into governance-related activities, and present men as change makers "Champions." |
| 6. Underrepresentation of women in the process is the major reason and the challenges to women's representation are the gender role, restricted mobility | 6. Conduct a rapid assessment to generate the case study and build the capacity of municipality people to keep the record-gender disaggregated data |
| 7. Lack of gender-disaggregated data in government offices | 7. Building the technical capacity of women-led organizations helps to raise the collective voice of women contributing to advocating for gender-inclusive planning and budgeting at local levels |
| 8. Lack of equal representation of women in decision-making process | 8. Sensitization on the gender differential impact of climate change has been strongly suggested in a community workshop, focused group discussion, and discussion with women-led organizations |
| 9. Loss of women's control over valuable resource | 9. Institutionalization of gender analysis as part of program design helps to increase gender-related actions-such as promoting women's participation, providing information, and integrating gender in a planning process |
| 10. Less achievement/progress on gender specific reports, activities, and progress | 10. Application of gender budgeting for the effective implementation of gender-inclusive planning |
| 11. Women are not aware about the plan, policy, subsidies, and other facilities | 11. Capacity development of local government based on capacity need assessment for gender-inclusive planning and budgeting |

| Key issues | Solution |
|---|---|
| 12. less agriculture productivity | 12. Increased access of women to climate resilient agriculture practices, availability of drought tolerant plants, seeds through farmer's field school |
| 13. Food scarcity and hunger especially among poor, Dalits, and indigenous women. | 13. Promote cash crops such as seasonal and off-season vegetable farming through FFS. Promote the concept of community farming or group farming |
| 14. Limited understanding about the socioeconomic impact of gender inequality | 14. Advocacy campaign to promote gender equality (community radio, community theatre, communication materials; booklets, best practices, posters, flex with key messages, day celebration (International women's day celebration, 16 days of activism against gender-based violence, etc) |

4.2.4 Solution to Gender Issues

Gender and women empowerment issues and concerns are integrated into all activities. However, considering the importance of gender-inclusive governance as a key element to mainstream gender into the implementation, the plan is focused on one gender-specific IPack on gender-inclusive governance. Therefore, the solutions to gender issues are associated with enhancing gender-inclusive governance.

The solutions to GESI issues are associated with enhancing gender-inclusive governance.

Table 13: Activities to enhance gender-inclusive governance

| Drivers | Activities Against Drivers |
|---|--|
| Inadequate exercise of gender-inclusive governance in climate change, SNRM practice | <ul style="list-style-type: none"> • Create informal learning and sharing platforms for grassroots-level women • Conduct local level policy discourses to ensure gender responsiveness and women's participation, access, control and leadership • Produce and publish best practices and learning in gendered governance • Conduct rapid assessment on women's contribution and involvement in SNRM/ CRLUP and management • Provide gender mainstreaming trainings/ workshops to local government and CBOs and concerned stakeholders • Conduct GESI focused social audits and public hearing • Conduct advocacy campaign to promote awareness on gender responsive information, available provisions and resources among CBOs/ women groups. This will include day celebration, integration of gender in local radio program, learning events, etc. <ul style="list-style-type: none"> • Increase women's participation • Share information about the latest news, update, notice, fund, plans and budget • Time information about training and meetings • Promote and engage leadership • Include and integrate males in advocacy campaigns and radio programs (the radio program will be integrated with other SNRM themes and activities) |

| Drivers | Activities Against Drivers |
|---------|---|
| | <ul style="list-style-type: none"> Engage male involvement to advocate gender and women's issues and concern in advocacy and media campaign. |

❖ **Major Activities and Outputs**

The activities and outputs proposed for enhancing gender-inclusive governance are presented in Table 14.

Table 14: Major activities and outputs for enhancing gender-inclusive governance

| Major Activities | Outputs |
|--|---|
| Increase access of women to SNRM and knowledge and information | Gender inclusive governance practiced and adopted climate resilient practices |
| Integrate gender and women's participation in local planning processes in SNRM | |

4.2.5 Integration of GESI and IP's issues into solution activities

The following special attention is required to mainstreaming women, Dalits, indigenous people, and marginalized communities in the implementation of ecosystem restoration plans for the river system:

- a. Provide opportunities to build capacity in natural resource management for users, particularly women, indigenous peoples, Dalits, and forest-dependent marginalized communities.
- b. Improve and synchronize CFUGs' operational plans in order to improve users' capabilities (women, Dalit, IPs, and marginalized users) and build a strong mechanism for GESI in the river system's forestry sector.
- c. Provide an opportunity for women with specific, major actions in the restoration of the hotspots, for example:
 - Provide women's capacity-building training in nursery establishment, seedling production and promotion of agroforestry and other opportunities
 - Invest in women's decision-making capacity building in forestry and agriculture activities
 - Minimize women's workloads in the collection of fuelwood: a) by providing cost-effective equipment and techniques, especially in alternative energy uses for cooking; b) by providing fodder seeds
 - Reduce social barriers (social and economic insecurity and lowered education and understanding level) for Dalit, indigenous, and other vulnerable ethnicity women to participate in ecosystem restoration activities such as sustainable forest management and agriculture land restoration
 - Engage women in agroforestry, FFS and trainings to ensure their incomes and knowledge enhancement

❖ **Inclusive Process and Plans for Indigenous People**

Special attention is given on FAO, FPIC Manual for Project Practitioners 2016, focused on an Indigenous Peoples' right and a good practice for local communities. Free, Prior and Informed Consent (FPIC) process is required for the implementation of any activities highlighted in the CERP. For this, implementing agency (CBOs) and project manager must follow 6 steps in different actions during CERP implementation in the river system:

Step 1: Identification of Indigenous Peoples' concerns and their representatives

Step 2: Document geographic and demographic information through participatory mapping

Step 3: Design a participatory communication plan and carry out iterative discussions through which project information will be discussed in a transparent way

Step 4: Reach consent, document Indigenous Peoples' needs that are to be included into the project and agree on feedback and complains mechanism

Step 5: Conduct participatory monitoring and evaluation of the agreement

Step 6: Document lessons learned and disclose information about project achievements.

CHAPTER 5 : INTERVENTION PACKAGE

5.1 Formulation of Intervention Packages

From problem and solution tree analysis the main problems along with their causes and effects are recorded, to come up with clear and manageable goals and the strategies to combat them. There are two main stages to this process: (1) the identification of negative aspects of existing situations (or key challenges) in the form of problem trees, and (2) the change of the problems into objectives leading to solution trees showing potential solutions or strategies that respond to the drivers and underlying causes.

It is important to understand and recognize stakeholder engagement and listen to the voices and concerns of forest dependent and poor/marginalized social groups in the process of prioritizing the CERP activities. All these intervention packages (IPacks) were developed based on the activities and key results identified from local stakeholder workshops and verified from expert planning workshops involving most of the key stakeholders. The IPacks developed mainly focused on reducing deforestation and forest degradation; enhancing adaptation/resilience building of vulnerable ecosystem and local community; and integrating gender and equity issues in governance practices in natural resource management and climate resilient land use practices. It provides activities for forest and carbon enhancement; climate resilient agriculture practices and land use practices; and reducing ecosystem and community vulnerability from climate-induced disasters.

Problem, Solution analysis and map demarcations done by participants are considered as a foundational step for formulating IPacks to group the activities. First the similar activities that are identified in solution analysis and their map demarcations are carefully reviewed against the underlying causes obtained in problem analysis. In next step, the activities are grouped based on adaptation and mitigation themes making sure it addresses the underlying causes and major problems (key drivers) identified during problem analysis. In addition, the findings of gender – a specific field study conducted by HIMAWANTI are integrated into the ipack. The gender study identified three key interventions focused on gender and women empowerment. However, the intervention package integrated most of the gender-related concerns in the ipack and added one gender-responsive government ipack as an advocacy campaign in the plan.

Ipacks are formulated based on this grouping such that each Ipacks address the major problems (drivers) and activities relate with solution analysis process. However, all activities identified in solution analysis are not reflected in IPack activities – as in reference to guidance from CERP manual Box 14 and section C1.2 based on which policy level interventions that are already reflected in REDD+ national strategy are not included in IPacks. Ipacks geographic focus and coverage areas were also closely reviewed to make sure that the upstream-downstream linkage issues are addressed, although geographic focus are not considered as a primary criterion for activity grouping.

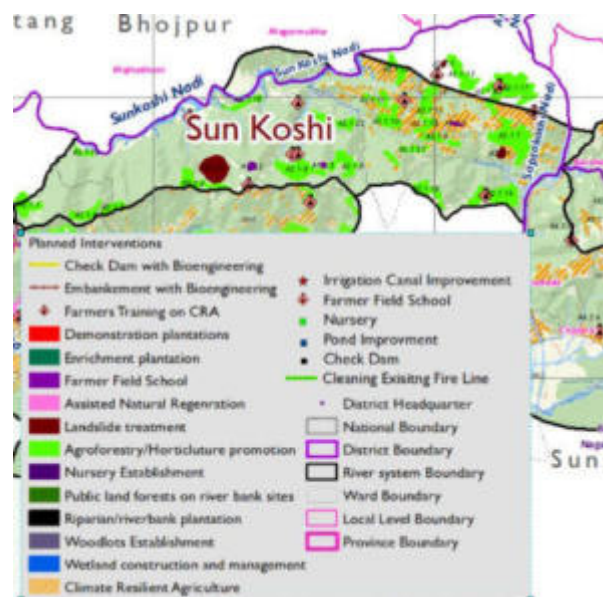
A number of activities that do not directly relate with ecosystem restoration were also noted during the problem-solution analysis process. These activities primarily include large scale infrastructure development along river corridors, revising national/provincial level policies, construction of local infrastructure, irrigation infrastructure, food security, water supply etc. Based on the guidance from project documents and CERP manual most strategic interventions that are feasible through activity prioritization are included in IPack formulation.

Table 15: Intervention packages for CERP

| Intervention Packages | Outputs | Drivers or barriers addressed |
|---|---|---|
| IPack 1: Climate resilient agriculture and land use practices | Farmers capacitated in climate resilient agriculture | Inadequate capacity and resource; Pests and diseases; Insufficient irrigation |
| | Improved climate-resilient land use practices | |
| IPack 2: Improving/maintaining river system landscape through soil and water conservation | Agroforestry promoted | Erosion/ landslide; Unsustainable harvesting and illegal logging |
| | Erosion/landslide controlled and sedimentation managed | |
| | Disaster risk management strengthened | |
| IPack 3: Capacity enhancement for sustainable forest management | Forest management strengthened | Ineffective forest management practices; Unsustainable harvesting and illegal logging; Encroachment of forestland |
| IPack 4: Restoration and rehabilitation of degraded forests | Improved forest cover through enrichment plantation and ANR | Unsustainable harvesting and illegal logging; Forest fire; Encroachment of forestland |
| | Forest fire mitigated | |
| | Income source of poor/marginalized forest users enhanced | |
| IPack 5: Advocacy campaign: Gender-inclusive governance campaign | Increased access of women to SNRM and knowledge and information | Lack of gender integration in SNRM, CCA, and DRR planning and implementation process |
| | Integrated gender and women's participation in local planning processes in SNRM | |

This CERP only covers those key results and IPacks that correspond to local level interventions. However, it also reveals a number of vital areas of interventions that can take place at national level such as- resolution of land tenure issues; interventions to regulate infrastructure development in forest area and Chure hillslopes; and others. These higher-level measures or interventions should also be incorporated into national strategies for successful implementation of CERP.

IPack activities also reflect up-mid-downstream linkages to foster integrated management approach. An activity mapped below at river system scale demonstrates that those activities under IPack 2 (such as landslide/erosion control, water sources conservation, flood mitigation) and IPack 3, 4 (such as ANR, Fire control, capacity building SFM) focus on upstream churia hill regions that are expected to reduce sedimentation and have profound impact on the morphology of the river and related disasters in the inner river valley. IPack 1 on CRA and IPack 5 on restoration of riverine landscape with plantation focus on these inner river valleys. IPack 6 being an advocacy-Gender governance package, focuses on the entire river system.



❖ **Strategies and Activities**

For each of the IPacks there are strategies (Table 16) and activities (Table 17). Strategies are followed by activities and provision of incentives that could encourage stakeholder’s participation, as well as change their current practices that would enhance resilience and mitigation benefits (Table 16). All the

activities developed are considered realistic and practical as regards their implementation. Ambiguous activities that are difficult to obtain clear and measurable outcomes have been excluded.

❖ **Summary of Feasibility Analysis**

Feasibility analysis was used to assess the strengths and weaknesses of the IPacks (Table 18), which can lead to desired results of the CERP. In the feasibility analysis, the risks and obstacles to implementation of each IPacks were assessed, and this provided the basis for assessing the overall feasibility of each IPack. Cost-effectiveness is also a vital criterion in feasibility analysis. The scores obtained through overall feasibility analysis at output levels indicate that all the IPs are reasonably feasible (Table 19). The feasibility analysis was duly verified from expert planning workshop.

❖ **Summary of Safeguard Analysis**

Safeguard analysis was done to identify social and environmental risks or threats (Table 20), as well as to identify where CERP interventions can contribute to significant social or environmental co-benefits (Table 21) Social risks are negative social side effects on poor and marginalized social groups while implementing the proposed IPacks. Women, IPs and marginalized minority groups, including Dalits among others, can experience discrimination and may face additional barriers to their participation and engagement that could limit their engagement within the project. Similarly, environmental risks are potential side effects from proposed interventions such as natural forest conversion, negative effects on biodiversity or other ecosystem services among others. In safeguard analysis, the measures to mitigate risks and enhance benefits were also assessed. The safeguard analysis matrix was duly verified during expert planning workshop.

❖ **Budget Plan**

The budget plan for CERP activities has been prepared based on approved district rate, and in close coordination with government officials at expert planning workshop, The quantitative implementation targets defined in the planning stage are the starting point for the budgeting process, followed by detail analysis of the activities, tasks and resources needed. The summary of budget plan for each IPacks is presented in Table 22. The detail budget plan with locations for interventions is presented in Annex 3.

❖ **Monitoring**

It is clearly essential to monitor the CERP implementation both for adaptive management of CERP and to be able to compensate or incentivize local stakeholders for their contribution to positive outcomes. For this, a monitoring protocol has been prepared (Table 23).

5.2 General Description of Intervention Packages

Table 16: General descriptions of IPacks

| Intervention Packages | IPacks description | Objectives | Strategies | Activities/incentives for Participation and Changing Stakeholder Practices |
|---|---|---|--|--|
| IPack 1: Climate resilient agriculture and land use practices | Farmers vulnerability have been increasing due to limited farm skill and technology, low investment capacity, inadequate irrigation facilities, increasing pest and diseases and poor market access which relates with inability to cope with climate change impacts. Eventually the result is increased pressure in forest resource. This intervention package thus provides solution to combat climate change impacts and enhance farm sustainability. Farmers are also facing problems of higher cost of agriculture input and low market price on sale. | <ul style="list-style-type: none"> • To capacitate vulnerable farmers, women, Dalits to adopt climate resilient agriculture practices • To enhance agriculture yield | <ul style="list-style-type: none"> • Improving resilience of farmers to climate change, disasters, price volatility and other shocks • Increase agricultural productivity of forest dependent and other smallholders (equal participation of men and women) | <ul style="list-style-type: none"> • Train farmers (prioritizing women) on climate resilient agriculture • Incentivize poor/marginalized farmers (skill development and equipment support) • Promotion of alternative irrigation practice, local livestock breed/crop varieties' improvement and cooperative farming to enhance yield • Promote organic farming with provision of compensating yield loss to reduce chemical inputs • Disease/pest control • Support agriculture commercialization |
| IPack 2: Improving/maintaining river system landscape through soil and water conservation | Landscape degradation within the river system is combined effect of natural and anthropogenic causes. It is mainly associated with fragile topography, climate instability and inappropriate land use practices. Natural hazards like erosion, landslide, forest fire and declining ecosystem services like declining water resource, forest resource and agriculture yield all are associated with landscape degradation. This IPack thus focuses on restoration | <ul style="list-style-type: none"> • To mitigate disaster risks to reduce community and ecosystem vulnerability • To enhance restoration of ecosystem services • To enhance local knowledge, awareness and | <ul style="list-style-type: none"> • Increase non-carbon benefits of forest ecosystems • Minimizing erosion, landslide through infrastructure development and also using indigenous knowledge, skills and customary practices • Promote changing annual crop into multiyear crop in Chure hill slopes | <ul style="list-style-type: none"> • Incentivize multiyear cropping/ horticulture • Promotion of agroforestry in marginal lands • Promote water conservation ponds in Chure hills • Promote fodder grass in slopy public lands • Project implementation in-line with priority of local government • Formation of school based eco-clubs |

| Intervention Packages | IPacks description | Objectives | Strategies | Activities/incentives for Participation and Changing Stakeholder Practices |
|---|--|--|---|---|
| | and maintaining the degraded landscape and livelihood improvement of local communities. | capacity on CRLUP and SNRM | <ul style="list-style-type: none"> • Implementation of projects in the collaboration with local government • Awareness raising through schools, media and other relevant measures • Trainings for capacity enhancement in CRLUP and SNRM | <ul style="list-style-type: none"> • Training/capacity building on soil and watershed conservation using bio-engineering |
| IPack 3: Capacity enhancement for sustainable forest management | Forest management regimes within the river system reflect Community Forest and Government Forest. These forest areas in Chure are subject to immense pressure. The problem of unsustainable harvesting and illegal logging prevails due to demand and supply gap. There is robust legal and policy framework in forest sector but lacks compliance in many ways. Limited access of CFUG members in decision-making, lack of clarity and uncertainty over forestland use, tenure, and resolution of households with unregistered land, widespread reports of corruption among different actors and law breaking in forest sector have weakened forest management efforts, accountability and transparency. This IPack focuses on improving forest management to resolve disparity | <ul style="list-style-type: none"> • To improve forest quality through effective implementation of sustainable forest management • To improve forest governance • To ensure women, IPs, Dalit and marginalized communities participation in sustainable forest management preparation and decision making process | <ul style="list-style-type: none"> • Improve capacity, institutional performance and service delivery of the forestry sector institutions (including intra district/province level coordination) • Improving capacity of CFUGs as well as other stakeholders for sustainable forest management • Improve collaboration, cooperation and synergy among sectoral policies, sectors and actors • Enhance the role of private sector in forestry to promote forest-base enterprises for livelihood and economic development • Promote GESI and increase access of indigenous people in sustainable forest management | <ul style="list-style-type: none"> • Financial and equipment support to encourage CFUGs for climate resilient sustainable forest management • Enhance forest sector transparency thereby, enhancing accountability of forest users and also reducing illegal activities • Promote GESI in participation and benefit sharing • Policy intervention for resolution of land tenure issues • Promote forest-based entrepreneurship • Decentralization of district based timber supply system • Development of compensatory mechanism for accidents during legal forest management activities • Incentive to security forces for capturing loggers and loggings. |

| Intervention Packages | IPacks description | Objectives | Strategies | Activities/incentives for Participation and Changing Stakeholder Practices |
|--|--|--|---|--|
| | among CBFUGs and government agencies and enrich forest resources. | | | |
| IPack 4: Restoration and rehabilitation of degraded forests | Forest encroachment, unsustainable harvesting and illegal logging, open grazing and forest fire are the major D&FD drivers in the river system. It is further worsened by weaknesses in forest enhancement. Limited livelihood opportunities of forest users and management weaknesses of CFUGs have hindered restoration and rehabilitation of degraded forests. This IPack seeks measures to tackle these weaknesses and restore degraded forests. | <ul style="list-style-type: none"> • To enhance forest cover through enrichment plantation • To capacitate CFUGs in handling forest fire • To provide forest dependent people with alternative resource and income generation opportunities | <ul style="list-style-type: none"> • Reduce carbon emissions, enhance forest carbon stocks, and improve supply of forest products • Promote livelihood improvement programs for poor and marginalized forest dependent people | <ul style="list-style-type: none"> • Support for nursery establishment and enrichment plantation • Enhancing technical capacity of CFUGs in plantation and nurturing of seedlings • Strengthen forest firefighting • Provide skill development trainings to increase income source of poor/marginalized forest users |
| IPack 5: Advocacy campaign: Gender-inclusive governance campaign | The under-representation of women in the decision-making process has resulted in the exclusion of women's specific needs and capacities in SNRM, CCA, and DRR. Increased influence of women in governance is important to identify and include gender-responsive program interventions to increase the adaptive capacity of vulnerable women. The advocacy campaigns will include local-level stakeholders and the | <ul style="list-style-type: none"> • Increase women's leadership in NRM, CCA, and DRR • Building women's knowledge and skills in resource conservation and management • Increase women's participation in decision-making forums | <ul style="list-style-type: none"> • Build network among women and women-led organizations for an enabling environment • Engage male and government representatives in the campaign | <ul style="list-style-type: none"> • Consider women's convenience while setting meeting agenda and venue • Provide transportation costs for attending the trainings • Ensure that women are aware of meetings or activities in an appropriate way • Provide opportunity to participate in learning events /platforms for women leaders and women champions |

| Intervention Packages | IPacks description | Objectives | Strategies | Activities/incentives Participation and Stakeholder Practices for Changing |
|-----------------------|---|---|------------|--|
| | community and leverage local-level funds and resources. | <ul style="list-style-type: none"> • Increase common understanding towards gender equality and women empowerment in SNRM | | |

5.3 Major Activities and Sub-Activities

Table 17: IPacks, major activities and sub-activities

| Intervention Packages | Major Activities | Sub-activities |
|---|--|---|
| IPack 1: Climate resilient agriculture and land use practices | Establish and operationalize Farmers Field Schools (FFS) | Identification and operationalization of FFS |
| | | Capacity-building in the use of weather information and its application in agricultural practices |
| | Implementation of climate-resilient land use practices | Implement climate resilient agriculture practices |
| | | Train and support farmers to adopt and apply climate-resilient land use practices |
| | | Support leasehold farming in abandoned agriculture land to pro-poor farmers |
| | | Promote On-farm water conservation measures for dry zone resilient agriculture practices |
| | IPack 2: Improving/maintaining river system landscape through soil and water conservation | Agroforestry promotion |
| Promote agroforestry with multiyear cropping/horticulture /on-farm conservation | | |
| Controlling erosion/landslide and management of sedimentation | | Landslide treatment |
| | | Construction of check dams and bioengineering for gully/debris torrent protection |
| | | Green Road management |
| Strengthening disaster risk management and awareness creation on climate resilient NRM | | Training/capacity building on soil and watershed conservation using bio-engineering |
| | | Climate resilient awareness campaign through Eco-clubs |

| Intervention Packages | Major Activities | Sub-activities |
|--|---|---|
| IPack 3: Capacity enhancement for sustainable forest management | Strengthening forest management | Support review/upgrade/renew of forest operational plans (FOPs) of community forest user groups (CFUGs) |
| | | Training and capacity development for implementation of FOPs |
| | | Equipment support for implementation of FOPs |
| | | Capacitate government staffs and CBOs on climate resilient forest management (ToF) |
| | | Governance training to government staffs and CFUGs to enhance accountability and transparency |
| IPack 4: Restoration and rehabilitation of degraded forests | Improvement of forest cover within national forest through enrichment plantation/ANR | Establish and support multi-purpose tree nurseries |
| | | Production of saplings |
| | | Enrichment plantation/ Assisted Natural Regeneration |
| | Forest fire control | Firefighter training and support firefighting equipment to CFUGs |
| | | Support firefighting equipment to security institutions |
| | | Training and equipment support to promote compost production from bushes and leaf litters |
| | | Customize fire alert system in Community Based Forest Management |
| Income source of poor/marginalized forest users enhanced halting illegal harvesting | Skill development trainings and equipment support | |
| IPack 5: Advocacy campaign: Gender-inclusive governance campaign | Increase access of women to SNRM and knowledge and information | Create informal learning and sharing platforms for grassroots-level women |
| | | Conduct local level policy discourses to ensure gender responsiveness and women's participation, access, control and leadership |

| Intervention Packages | Major Activities | Sub-activities |
|-----------------------|---|---|
| | | Produce and publish best practices and learning in gendered governance |
| | Integrate gender and women's participation in local planning processes in SNRM | Conduct rapid assessment on women's contribution and involvement in SNRM |
| | | Provide gender mainstreaming trainings/ workshops to local government and CBOs |
| | | Conduct GESI focused social audits and public hearing |
| | | Conduct advocacy campaign and promote awareness on gender responsive information, available provisions and resources among CBOs/ women groups |
| | | Engage male involvement to advocate gender and women's issues and concern in campaign |

5.4 Feasibility Analysis

Table 18: Feasibility analysis

| Outputs | Activities | Implementation or Obstacle | Risk | Risk Measures | Reduction | Risk Reduction Targets | Indicators |
|--|---|--|---|--|-----------|--|--|
| IPack 1: Climate resilient agriculture and land use practices | | | | | | | |
| Farmers capacitated in climate resilient agriculture | Identification and operationalization of FFS | <ul style="list-style-type: none"> Exclusion of poor and marginalized farmers Lower investment capacity of small farmers | <ul style="list-style-type: none"> Drop out of participants of FFS | <ul style="list-style-type: none"> Build transparent selection criteria Incentives for small farmers Encourage and incentivize participants | | <ul style="list-style-type: none"> Selection criteria to include poor and marginalized are in place 100 % farmers attending FFS are incentivized to adopt climate resilient agriculture At least 80% of FFS participants complete FFS package | <ul style="list-style-type: none"> Selection criteria Proportion of farmers incentivized % of participants who complete FFS package |
| Improved climate-resilient land use practices | Train and support farmers to adopt and apply climate-resilient land use practices | | | | | | |
| IPack 2: Improving/maintaining river system landscape through soil and water conservation | | | | | | | |
| Agroforestry promoted | Establish On-farm tree nurseries | <ul style="list-style-type: none"> Disparity in site and species selection | | <ul style="list-style-type: none"> Prior consensus with communities for site and species selection | | <ul style="list-style-type: none"> At least 2 consultation workshops organized | <ul style="list-style-type: none"> Number of consultation workshops conducted to select site and species |
| | Promote agroforestry with multiyear cropping/horticulture/on-farm conservation | <ul style="list-style-type: none"> Unwillingness due to higher opportunity cost of land | | <ul style="list-style-type: none"> Promotion of high value agroforestry Incentivize socially and economically marginalized households | | <ul style="list-style-type: none"> Agroforestry in 1005 ha land Proportionate sharing of benefits among women, Dalit Janajati and marginalized groups | <ul style="list-style-type: none"> Land area with agroforestry % of women, Dalit Janajati and marginalized groups incentivized |
| Erosion/landslide controlled and | Landslide treatment | <ul style="list-style-type: none"> Local knowledge and practices missing in the stabilization measures | | <ul style="list-style-type: none"> Integrate local and knowledge practices | | <ul style="list-style-type: none"> At least 3 landslides treated with integration of structural & | <ul style="list-style-type: none"> Number of landslides treated |

| Outputs | Activities | Implementation Risk or Obstacle | Risk Reduction Measures | Risk Reduction Targets | Indicators |
|--|---|--|---|---|--|
| sedimentation managed | | <ul style="list-style-type: none"> • Influential decision in implementation | <ul style="list-style-type: none"> • Risk prioritization prior to implementation in coordination with local government | <ul style="list-style-type: none"> • bioengineering measures and risk prioritization • Local knowledge and practices integrated for the landslide treatment | <ul style="list-style-type: none"> • Number of landslide treatment with local knowledge and practices |
| | Construction of check dams and bioengineering for gully/Debris torrent protection | <ul style="list-style-type: none"> • Local knowledge and practices missing in the bioengineering for the protection • Influential decision in implementation | <ul style="list-style-type: none"> • Integrate local knowledge and practices with structural and non-structural (bioengineering) measures • Risk prioritization during mitigation | <ul style="list-style-type: none"> • At least 1 gullies/debris torrent stabilized with integration of structural & non-structural measures and risk prioritization | <ul style="list-style-type: none"> • Number of gullies stabilized with local knowledge and practices |
| Disaster risk management strengthened | Training/capacity building on soil and watershed conservation using bio-engineering | <ul style="list-style-type: none"> • Disparity in selection of participants | <ul style="list-style-type: none"> • Build transparent selection criteria | <ul style="list-style-type: none"> • At least 50 % women, 13 % Dalit and 31 % indigenous peoples representatives trained on soil and watershed conservation | <ul style="list-style-type: none"> • Number of women, Dalits and indigenous representatives trained |
| IPack 3: Capacity enhancement for sustainable forest management | | | | | |
| Forest management strengthened | Review/upgrade/renew of forest operational plans (FOPs) of community forest user groups (CFUGs) | <ul style="list-style-type: none"> • Unwillingness of CFUGs due to lack of budget and technical knowledge | <ul style="list-style-type: none"> • Provide financial and technical support | <ul style="list-style-type: none"> • At least 10 CFUGs receive financial and technical support | <ul style="list-style-type: none"> • Number of CFUGs receiving financial and technical support |
| | Training and capacity development for implementation of FOPs | <ul style="list-style-type: none"> • Disparity in selection of participants (recommendation of | <ul style="list-style-type: none"> • Build transparent selection criteria for CFUGs | <ul style="list-style-type: none"> • At least 50 % women, 13 % Dalit and 31 % indigenous peoples | <ul style="list-style-type: none"> • Number of women, Dalits and indigenous |

| Outputs | Activities | Implementation or Obstacle | Risk Measures | Risk Reduction | Risk Reduction Targets | Indicators |
|--|---|--|---|----------------|--|---|
| | | participants from CFUGs) | | | representatives trained in implementation of FOPs | representatives trained |
| | Equipment support for implementation of FOPs | <ul style="list-style-type: none"> Inadequate technical knowledge in handling of equipment | <ul style="list-style-type: none"> Sensitize about BRCRN project scope and deliverables Technical trainings on equipment handling | | <ul style="list-style-type: none"> At least 10 CFUGs receive equipment support with trained individuals | <ul style="list-style-type: none"> Number of CFUGs receiving equipment and its handling support |
| | Capacitate government staffs and CBOs on climate resilient forest management (TOF) | <ul style="list-style-type: none"> Level of understanding on climate resilient forest management practices among the trainee and trainers | <ul style="list-style-type: none"> Adoption of peer learning method | | <ul style="list-style-type: none"> At least 2 events of joint training (government staff and CBO representatives) | <ul style="list-style-type: none"> Number of joint trainings |
| | Governance training to government staffs and CFUGs to enhance accountability and transparency | <ul style="list-style-type: none"> Gaps in understanding of governance in forest management procedures between government authority & CFUGs | <ul style="list-style-type: none"> Joint trainings/roundtable discussion | | <ul style="list-style-type: none"> Bi-annual joint trainings for 5 years | <ul style="list-style-type: none"> Number of joint training events organized |
| IPack 4: Restoration and rehabilitation of degraded forests | | | | | | |
| Improved forest cover through enrichment plantation/ANR | Establish and support multi-purpose tree nurseries | <ul style="list-style-type: none"> Disparity in site and species selection | <ul style="list-style-type: none"> Prior consensus with communities for site and species selection | | <ul style="list-style-type: none"> At least 1 consultation workshops organized | <ul style="list-style-type: none"> Number of consultation workshops conducted to select site and species |
| | Enrichment plantation/ANR | <ul style="list-style-type: none"> Conflict on seedling selection and procedure (either plantation or assisted natural regeneration) | <ul style="list-style-type: none"> Prior consultation with CFUGs | | <ul style="list-style-type: none"> At least 1 consultation meeting with each CFUGs | <ul style="list-style-type: none"> Number of prior consultations |

| Outputs | Activities | Implementation Risk or Obstacle | Risk Reduction Measures | Risk Reduction Targets | Indicators |
|---|---|--|--|--|--|
| Forest fire mitigated | Firefighter training and support firefighting equipment to CFUGs | <ul style="list-style-type: none"> Lack of technical knowledge in handling of equipment | <ul style="list-style-type: none"> Technical trainings on equipment handling | <ul style="list-style-type: none"> At least 5 CFUGs are well equipped with trained firefighting groups | <ul style="list-style-type: none"> Number of well-equipped CFUGs with trained firefighting groups |
| | Training and equipment support to promote compost production | <ul style="list-style-type: none"> Elite capture Cheaper alternatives to compost in the market | <ul style="list-style-type: none"> Transparent selection to include most fire prone CFs Awareness raising programs on the significance of composting conducted for CFUGs with opportunities to the market linkages | <ul style="list-style-type: none"> At least 3 most fire prone CFs are included At least 3 awareness raising events conducted covering 3 CFUGs | <ul style="list-style-type: none"> Number of most fire prone CFs included Number of awareness raising events |
| Income source of poor/marginalized forest users enhanced | Skill development trainings and equipment support | <ul style="list-style-type: none"> Low investment capacity of trainees on small and medium enterprise establishment | <ul style="list-style-type: none"> Incentivize to develop small and medium enterprise (nursery, agroforestry) | <ul style="list-style-type: none"> More than 50% trainees involved in income generation | <ul style="list-style-type: none"> % of trainees involved in income generation |
| IPack 5: Advocacy campaign: Gender-inclusive governance campaign | | | | | |
| Increased access of women to SNRM and knowledge and information | Create informal learning and sharing platforms for grassroots-level women | <ul style="list-style-type: none"> Social norms and values restricting women to participate and give time for informal learning and sharing platforms | <ul style="list-style-type: none"> Identification of social and structural barriers faced by women through sensitization measures | <ul style="list-style-type: none"> At least one gender sensitization learning event per year | <ul style="list-style-type: none"> Number of gender sensitization events conducted |
| | Conduct local level policy discourses to ensure gender responsiveness and women's participation, access, control and leadership | <ul style="list-style-type: none"> Women lack access and resources about local level policies making them vulnerable | <ul style="list-style-type: none"> Awareness and sharing of policies | <ul style="list-style-type: none"> At least one event held on policy dissemination among women groups At least 70% of target population participated | <ul style="list-style-type: none"> Event/ activity report Proportion of target population reached |

| Outputs | Activities | Implementation Risk or Obstacle | Risk Reduction Measures | Risk Reduction Targets | Indicators |
|---|--|---|---|--|---|
| | Produce and publish best practices and learning in gendered governance | <ul style="list-style-type: none"> • Lack of resources | <ul style="list-style-type: none"> • Ensure availability of resources | <ul style="list-style-type: none"> • Allocate budget for production and publication | <ul style="list-style-type: none"> • At least one report containing five best practices published and disseminated |
| Integrated gender and women's participation in local planning processes in SNRM | Conduct rapid assessment on women's contribution and involvement in SNRM | <ul style="list-style-type: none"> • Inadequate budget | <ul style="list-style-type: none"> • Explore budget availability | <ul style="list-style-type: none"> • Integrate subcomponents on ongoing studies | <ul style="list-style-type: none"> • Assessment reports |
| | Provide gender mainstreaming trainings/workshops to local government and CBOs | <ul style="list-style-type: none"> • Gender is not a priority | <ul style="list-style-type: none"> • Raise awareness about long-term benefits after participating in gender workshops/ workshops | <ul style="list-style-type: none"> • Conduct in-person meetings with potential participants to understand their needs | <ul style="list-style-type: none"> • Number of trainings conducted |
| | Conduct GESI focused social audits and public hearing | <ul style="list-style-type: none"> • Lack of transparency • Inadequate budget • Exclusion of women and marginalized groups | <ul style="list-style-type: none"> • Increase practices for transparency through networking meetings, regular meetings • Policy guidance for ensuring inter-sectionality in social audits and public hearing • Adopt participatory tools for public hearing such as role-plays | <ul style="list-style-type: none"> • Regular meetings/ events conducted to increase transparency | <ul style="list-style-type: none"> • Number of social audit/ public hearings conducted • Percentage of women including Dalits and IPs participation • Number of issues raised on intersectional issues |
| | Conduct advocacy campaign and promote awareness on gender responsive information, available provisions and | <ul style="list-style-type: none"> • Inadequate interest and motivation of concerned institutions | <ul style="list-style-type: none"> • Raise awareness about long-term benefits of information dissemination | <ul style="list-style-type: none"> • Continuous follow-up meetings between institutions and women groups/ CBOs | <ul style="list-style-type: none"> • Number of events between institutions and women groups/ CBOs |

| Outputs | Activities | Implementation Risk or Obstacle | Risk Reduction Measures | Risk Reduction Targets | Indicators |
|---------|--|---|---|---|---|
| | resources among CBOs/ women groups | | | | |
| | Engage male involvement to advocate gender and women's issues and concern in campaign | <ul style="list-style-type: none"> • Less priority | <ul style="list-style-type: none"> • Raise awareness about long-term benefits, social prestige | <ul style="list-style-type: none"> • Continuous follow-up meetings | <ul style="list-style-type: none"> • Frequency of male involvement in gender and women's issues and concerns |

Table 19: Overall feasibility analysis of IPacks

| Intervention Packages | Outputs | Implementation risks/obstacles L=3/M=2/H=1 | Cost effectiveness of reduction measures H=3/M=2/L=1 | Cost to implement L=3/M=2/H=1 | Opportunity cost L=3/M=2/H=1 | Incentive Measures H=3/M=2/L=1 | Total score |
|--|---|---|---|----------------------------------|---------------------------------|-----------------------------------|-------------|
| IPack 1: Climate resilient agriculture and land use practices | Farmers capacitated in climate resilient agriculture | 3 | 3 | 2 | 3 | 2 | 13 |
| | Improved climate-resilient land use practices | 3 | 3 | 2 | 3 | 2 | 13 |
| IPack 2: Improving/maintaining river system landscape through soil and water conservation | Agroforestry promoted | 3 | 3 | 2 | 3 | 2 | 13 |
| | Erosion/landslide controlled and sedimentation managed | 2 | 2 | 1 | 2 | 3 | 10 |
| | Disaster risk management strengthened | 2 | 3 | 3 | 3 | 2 | 13 |
| IPack 3: Capacity enhancement for sustainable forest management | Forest management strengthened | 2 | 3 | 2 | 2 | 3 | 12 |
| IPack 4: Restoration and rehabilitation of degraded forests | Improved forest cover through enrichment plantation and ANR | 2 | 3 | 1 | 3 | 2 | 11 |
| | Forest fire mitigated | 3 | 2 | 2 | 2 | 2 | 11 |
| | Income source of poor/marginalized forest users enhanced | 2 | 3 | 2 | 1 | 3 | 13 |

| Intervention Packages | Outputs | Implementation risks/obstacles L=3/M=2/H=1 | Cost effectiveness of risk reduction measures H=3/M=2/L=1 | Cost to implement L=3/M=2/H=1 | Opportunity cost L=3/M=2/H=1 | Incentive Measures H=3/M=2/L=1 | Total score |
|---|---|---|--|----------------------------------|---------------------------------|-----------------------------------|-------------|
| IPack 5: Advocacy campaign: Gender-inclusive governance campaign | Increased access of women to SNRM and knowledge and information | 2 | 3 | 3 | 3 | 3 | 14 |
| | Integrated gender and women's participation in local planning processes in SNRM | 2 | 3 | 3 | 3 | 3 | 14 |

5.5 Safeguard Analysis

Table 20: Safeguard analysis (risk)

| Outputs | Activities | Social & Environmental risk | Risk reduction measures | Risk reduction targets | Indicators |
|--|---|--|---|---|--|
| IPack 1: Climate resilient agriculture and land use practices | | | | | |
| Farmers capacitated in climate resilient agriculture | Identification and operationalization of FFS | <ul style="list-style-type: none"> Participation from elite groups might be high | <ul style="list-style-type: none"> Ensure participation of farmers including socially and economically marginalized group (IPs, women, Dalit etc.) | <ul style="list-style-type: none"> At least 50% women, 13% Dalit and 31% Indigenous people are included in group at FFS | <ul style="list-style-type: none"> % of women, Dalit and Indigenous people included in group at FFS |
| Improved climate-resilient land use practices | Train and support farmers to adopt and apply climate-resilient land use practices | <ul style="list-style-type: none"> Lack of commitment by marginalized farmers | <ul style="list-style-type: none"> Ensure participation of farmers including socially and economically marginalized group (IPs, women, Dalit etc.) Incentives for small farmers | <ul style="list-style-type: none"> 50% women, 13% Dalit and 31% Indigenous people are included 100 % farmers involved are incentivized to adopt climate resilient agriculture | <ul style="list-style-type: none"> % of women, Dalit and Indigenous people included Proportion of marginalized farmers incentivized |
| IPack 2: Improving/maintaining river system landscape through soil and water conservation | | | | | |
| Agroforestry promoted | Establish On-farm tree nurseries | <ul style="list-style-type: none"> Land tenure issues on nursery site Limited availability of quality seed of demanded species | <ul style="list-style-type: none"> Consultation meetings Demand analysis for choice of seedlings species | <ul style="list-style-type: none"> At least 1 consultation meeting to screen and address the land tenure issues At least 50% seedlings produced are of native species | <ul style="list-style-type: none"> Number of nursery sites screened and land tenure issue addressed Proportion of native species' seedlings produced |
| | Promote agroforestry with multiyear cropping /horticulture/ on-farm conservation | <ul style="list-style-type: none"> Human-wildlife conflicts due to improved habitat and connectivity | <ul style="list-style-type: none"> Sensitization events for human-wildlife conflict | <ul style="list-style-type: none"> At least 22 sensitization events (1 at each hotspot) on reducing human wildlife conflict; improving habitat and connectivity) | <ul style="list-style-type: none"> Number of sensitization events conducted |

| Outputs | Activities | Social & Environmental risk | Risk reduction measures | Risk targets reduction | Indicators |
|--|---|--|---|---|--|
| Erosion/landslide controlled and sedimentation managed | Landslide treatment | <ul style="list-style-type: none"> • Durability of the structure due to fragile geology and climatic extremes | <ul style="list-style-type: none"> • Ensure technically sound structure following the design guideline | <ul style="list-style-type: none"> • Number of planned structures follow design guideline | <ul style="list-style-type: none"> • Number of structure following the guidelines |
| | Construction of check dams and bioengineering for gully/Debris torrent protection | <ul style="list-style-type: none"> • Durability of the structure due to fragile geology and climatic extremes • Occupational hazard for the construction workers | <ul style="list-style-type: none"> • Ensure technically sound structure following the design guideline • Provide awareness on the occupational hazards and the protective gear for the construction related works | <ul style="list-style-type: none"> • Design guideline followed • 100 % construction workers aware about the occupational hazards with the protective gear | <ul style="list-style-type: none"> • Number of structures following the guidelines • Proportion of the construction workers aware on the occupational hazards with the protective gear |
| IPack 3: Capacity enhancement for sustainable forest management | | | | | |
| Forest management strengthened | Review/upgrade/renew of forest operational plans (FOPs) of community forest user groups (CFUGs) | <ul style="list-style-type: none"> • Similar FOPs in varying topographical settings (replication of FOPs of Bhavar, Terai forests) | <ul style="list-style-type: none"> • Incorporate sensitivity analysis including topography, geology & geomorphic process | <ul style="list-style-type: none"> • 100% updated FOPs are based on sensitivity analysis | <ul style="list-style-type: none"> • FOPs with sensitivity analysis |
| | Training and capacity development for implementation of FOPs | <ul style="list-style-type: none"> • Selection bias of participants can lead to lower level of outcome | <ul style="list-style-type: none"> • Establish transparent selection criteria | <ul style="list-style-type: none"> • 100% eligible and efficient personnel | <ul style="list-style-type: none"> • More than 90% achievement level in sustainable forest management |
| | Equipment support for implementation of FOPs | <ul style="list-style-type: none"> • Occupational health risks (injuries) due to inappropriate safety measures | <ul style="list-style-type: none"> • Training on OHS good practices, protocols and equipment to Trainers/extension staff | <ul style="list-style-type: none"> • 3 trainings to CFUGs | <ul style="list-style-type: none"> • Number of person trained |
| IPack 4: Restoration and rehabilitation of degraded forests | | | | | |

| Outputs | Activities | Social & Environmental risk | Risk reduction measures | Risk targets reduction | Indicators |
|---|---|--|---|---|--|
| Improved forest cover through enrichment plantation and ANR | Establish and support multi-purpose tree nurseries | <ul style="list-style-type: none"> Land tenure issues on nursery site Limited availability of quality seed of demanded species | <ul style="list-style-type: none"> Consultation meetings Demand analysis for choice of seedlings species | <ul style="list-style-type: none"> At least 1 consultation meeting to screen and address the land tenure issues At least 50% seedlings produced are of native species | <ul style="list-style-type: none"> Number of nursery sites screened and land tenure issue addressed Proportion of native species' seedlings produced |
| | Enrichment plantation/ANR | <ul style="list-style-type: none"> Introduction of nonnative species can pose a risk to the local biodiversity Loss of species having current social use can worsen livelihood of marginal households | <ul style="list-style-type: none"> Promote tree species which are locally adapted/native Provision of alternatives to affected marginal households | <ul style="list-style-type: none"> 100 % of the species will be locally adapted/native species | <ul style="list-style-type: none"> Proportion of local species in enrichment planation |
| Forest fire mitigated | Firefighter training and support firefighting equipment to CFUGs | <ul style="list-style-type: none"> Firefighting without sufficient protective equipment or with inappropriate practices could lead to personal injuries Possibility of exclusion of women | <ul style="list-style-type: none"> Ensure trained groups are well aware of protective measures and procedures of fire controlling in the field through demonstration & examination Promote inclusion/participation of women | <ul style="list-style-type: none"> All members are trained At least 20% participants are women | <ul style="list-style-type: none"> Number of trained members on the use of firefighting equipment Proportion of women participants |
| IPack 5: Advocacy campaign: Gender-inclusive governance campaign | | | | | |
| Increased access of women to SNRM and knowledge and information | Create informal learning and sharing platforms for grassroots-level women | <ul style="list-style-type: none"> Possibility of elite women capture Possibility of the exclusion of Dalits and IPs women Social norms and values restricting women to participate and give time for | <ul style="list-style-type: none"> Promote inclusion/participation of Dalits and IPs (Women) Organize sensitization learning events to remove restrictions | <ul style="list-style-type: none"> At least 20% participants are Dalits and IPs women At least one gender sensitization learning event per year | <ul style="list-style-type: none"> % of Dalits and IPs women Number of gender sensitization learning events |

| Outputs | Activities | Social & Environmental risk | Risk reduction measures | Risk targets reduction | Indicators |
|---|---|---|--|---|--|
| | | informal learning and sharing platforms | | | |
| | Conduct local level policy discourses to ensure gender responsiveness and women's participation, access, control and leadership | <ul style="list-style-type: none"> • Change in gender roles not easily accepted posing threats to social norms and values | <ul style="list-style-type: none"> • Conduct GESI trainings and awareness campaigns and policy reviews to strengthen the GESI initiatives | <ul style="list-style-type: none"> • 50% men and women know about the GESI policy and integration strategies | <ul style="list-style-type: none"> • Province and local level policy reviewed |
| | Produce and publish best practices and learning in gendered governance | <ul style="list-style-type: none"> • Gendered governance restricting women to participate • Women participation in NRM sectors can pose threat to social change | <ul style="list-style-type: none"> • Document of good and best practices in gendered governance that has minimized social discrimination and women empowered reducing GBV as well | <ul style="list-style-type: none"> • Gendered governance best practices documented and learning shared for social change | <ul style="list-style-type: none"> • Best practices in gendered governance documented and published |
| Integrated gender and women's participation in local planning processes in SNRM | Conduct rapid assessment on women's contribution and involvement in SNRM | <ul style="list-style-type: none"> • Women not being empowered could hinder their participation • Leadership discrimination among women and elite captures | <ul style="list-style-type: none"> • Rapid assessment on women's contribution and involvement in NRM/CRLUP and management to be conducted and shared for minimizing social barriers | <ul style="list-style-type: none"> • % of women's contribution and involvement analyzed and further plans developed | <ul style="list-style-type: none"> • Rapid assessment conducted |
| | Provide gender mainstreaming trainings/ workshops to local government and CBOs | <ul style="list-style-type: none"> • GESI not prioritized | <ul style="list-style-type: none"> • Trainings to be provided to mainstream gender increasing the trend of preparing action plans as GESI priority | <ul style="list-style-type: none"> • % of understanding level and mainstreaming of GESI well adopted | <ul style="list-style-type: none"> • GESI mainstreaming training and workshops raised awareness |

| Outputs | Activities | Social & Environmental risk | Risk reduction measures | Risk targets reduction targets | Indicators |
|---------|---|--|--|--|--|
| | Conduct GESI focused social audits and public hearing | <ul style="list-style-type: none"> • Inclusive transparency and practices limited and not prioritized | <ul style="list-style-type: none"> • Regularly conduct GESI focused audits and public hearing to increase transparency and good governance | <ul style="list-style-type: none"> • % of local institutions practice GESI focused social audits and public hearing for social and strong governance practice | <ul style="list-style-type: none"> • GESI focused social audit and public hearing conducted regularly |
| | Conduct advocacy campaign and promote awareness on gender responsive information, available provisions and resources among CBOs/ women groups | <ul style="list-style-type: none"> • Gender responsive awareness not shared or available as they are not prioritized | <ul style="list-style-type: none"> • Awareness promotion on gender responsive information and ensure to make available to all | <ul style="list-style-type: none"> • % of CBOs and women groups made aware on gender responsive information and access to resources increased | <ul style="list-style-type: none"> • Gender responsive information and availability access made easy |
| | Engage male involvement to advocate gender and women's issues and concern in campaign | <ul style="list-style-type: none"> • Men not interested for social change and not supportive too • Women participation not ensured in NRM/CRLUP and management | <ul style="list-style-type: none"> • Advocating GESI and women's issues among male and inform on transformative change and recognizing women's voice for change, reduce GBV | <ul style="list-style-type: none"> • % of male engagement in GESI and women's issues help change the social norms and values | <ul style="list-style-type: none"> • Male involvement increased in advocacy of GESI and women's issues and minimized social disparities |

Table 21: Safeguard analysis (benefits)

| Outputs | Activities | Benefits | Benefit measures | enhancement targets | Indicators |
|--|---|--|---|---|---|
| IPack 1: Climate resilient agriculture and land use practices | | | | | |
| Farmers capacitated in climate resilient agriculture | Identification and operationalization of FFS | <ul style="list-style-type: none"> Increased farm productivity | <ul style="list-style-type: none"> Continuity of FFS for longer period (one crop cycle may not be sufficient) Integration of FFS in municipal agriculture section² | <ul style="list-style-type: none"> FFS operated for whole project period All FFS will be integrated in respective municipal agriculture section | <ul style="list-style-type: none"> Number of FFS operated for whole project period Number of FFS owned and run by local government |
| Improved climate-resilient land use practices | Train farmers on climate-resilient land use practices | <ul style="list-style-type: none"> Enhance soil organic carbon Sustain farm productivity | <ul style="list-style-type: none"> Provide financial, equipment and technological support to farmers adopting climate resilient land use practices³ Promote climate resilient commercial farming in collaboration with local government⁴ Promote organic farming and Integrated Pest Management system | <ul style="list-style-type: none"> At least 50% farmers adopting climate resilient land use practices will be supported Project will support at least one municipality for institutional procedures and marketing At least 50% share of fertilizer and pesticides is organic | <ul style="list-style-type: none"> Proportion of farmers supported Number of municipality assisting institutional procedures and marketing Decrease in use of chemical fertilizer and pesticides |
| IPack 2: Improving/maintaining river system landscape through soil and water conservation | | | | | |
| Agroforestry promoted | Establish On-farm tree nurseries | <ul style="list-style-type: none"> Enhance seedling availability for plantation | <ul style="list-style-type: none"> Demand based seedling production (fruit, fodder etc.) | <ul style="list-style-type: none"> Seedling production will meet 100% demand | <ul style="list-style-type: none"> Proportion of seedlings used for plantation |
| | Promote agroforestry with multiyear cropping/ | <ul style="list-style-type: none"> Erosion control | <ul style="list-style-type: none"> Prioritize cash crops, fast growing fodder trees and grasses | <ul style="list-style-type: none"> At least 50% cash crops and fodder trees | <ul style="list-style-type: none"> Proportion of cash crops and fodder trees in plantation |

² Development of FFS as on-farm learning center in the long run (even after project completion)

³ Seed money, soft loans, crop/livestock insurance, production based incentives, seed bank, subsidies in farm equipments, support for alternative irrigation facilities (earthbag ponds, drip irrigation, rainwater harvesting, deep boring, solar pumps and others), storage (cold store, chilling center) and processing facilities

⁴ Assist in institutional procedures including registration, PAN acquisition, accounting, renewal and others; marketing support (branding, packaging, negotiations)

| Outputs | Activities | Benefits | Benefit measures | enhancement targets | Indicators |
|--|---|--|---|--|--|
| | horticulture/on-farm conservation | <ul style="list-style-type: none"> • Enhance income generation opportunities • Decrease in forest dependency | | | |
| Erosion/landslide controlled and sedimentation managed | Landslide treatment | <ul style="list-style-type: none"> • Reduce loss and damage • Reduce sedimentation | <ul style="list-style-type: none"> • Prioritize high value multipurpose plant species for bioengineering | <ul style="list-style-type: none"> • At least 50% use of high value multipurpose plant species for bioengineering | <ul style="list-style-type: none"> • Proportion use of high value multipurpose plant species for bioengineering |
| | Construction of check dams and bioengineering for gully/debris torrent protection | <ul style="list-style-type: none"> • Reduce sedimentation in downstream • Reduce risks of flash floods and minimize settlement vulnerability | <ul style="list-style-type: none"> • Prioritize high value multipurpose plant species for bioengineering | <ul style="list-style-type: none"> • At least 50% use of high value multipurpose plant species for bioengineering | <ul style="list-style-type: none"> • Proportion use of high value multipurpose plant species for bioengineering |
| IPack 3: Capacity enhancement for sustainable forest management | | | | | |
| Forest management strengthened | Review/upgrade/renew of forest operational plans (FOPs) of community forest user groups (CFUGs) | <ul style="list-style-type: none"> • Support annual silvicultural operations for sustainable forest management | <ul style="list-style-type: none"> • Update FOPs with sensitivity analysis based on local scenario • Integrate forest based entrepreneurship development and income generation • Multi-stakeholder sharing for quality assurance of FOPs | <ul style="list-style-type: none"> • 100% CFUGs update FOPs with sensitivity analysis and integrating forest based entrepreneurship development | <ul style="list-style-type: none"> • Proportions of CFUGs with updated FOPs |
| | Training and capacity development for implementation of FOPs | <ul style="list-style-type: none"> • Enhance capacity of CFUGs on sustainable forest management | <ul style="list-style-type: none"> • Involve all CFUGs within River System in trainings | <ul style="list-style-type: none"> • 100% CFUGs participate in trainings | <ul style="list-style-type: none"> • Proportion of CFUGs participating in trainings |

| Outputs | Activities | Benefits | Benefit measures | Benefit enhancement targets | Indicators |
|--|---|--|--|---|---|
| | Equipment support for implementation of FOPs | <ul style="list-style-type: none"> Enhance capacity of CFUGs on sustainable forest management | <ul style="list-style-type: none"> Support all CFUGs within River System | <ul style="list-style-type: none"> 100% CFUGs receive equipment support | <ul style="list-style-type: none"> Proportion of CFUGs receiving equipment support |
| | Capacitate government staffs and CBOs on climate resilient forest management (TOF) | <ul style="list-style-type: none"> Increase skilled manpower on climate resilient forest management | <ul style="list-style-type: none"> Sensitize 100% users of community forest on climate resilient forest management | <ul style="list-style-type: none"> At least 90% users will be aware of climate resilient forest management | <ul style="list-style-type: none"> Proportion of users participating in sensitization program |
| | Governance training to government staffs and CFUGs to enhance accountability and transparency | <ul style="list-style-type: none"> Good forest governance | <ul style="list-style-type: none"> Public hearing Make information available in DFO websites | <ul style="list-style-type: none"> Bi-annual public hearing and update of website information | <ul style="list-style-type: none"> Number of public hearings annually Availability of information in websites |
| IPack 4: Restoration and rehabilitation of degraded forests | | | | | |
| Improved forest cover through enrichment plantation and ANR | Establish and support multi-purpose tree nurseries | <ul style="list-style-type: none"> Enhance seedling availability for plantation | <ul style="list-style-type: none"> Demand based seedling production (fruit, fodder etc.) | <ul style="list-style-type: none"> Seedling production will meet 100% demand | <ul style="list-style-type: none"> Proportion of seedlings used for plantation |
| | Enrichment plantation/ANR | <ul style="list-style-type: none"> Enhance forest quality and carbon stock | <ul style="list-style-type: none"> Plantation of fast growing and locally adapted plant species Promoting natural regeneration Bio-fencing for protection | <ul style="list-style-type: none"> At least 70% of fast growing and locally adapted/native plant species | <ul style="list-style-type: none"> Proportion of fast growing and locally adapted/native plant species |
| Forest fire mitigated | Firefighter training and support firefighting equipment to CFUGs | <ul style="list-style-type: none"> Enhance capacity on forest fire control | <ul style="list-style-type: none"> Collaborate with security institutions and also provide equipment support | <ul style="list-style-type: none"> At least 5 sets of firefighting equipment to security institutions | <ul style="list-style-type: none"> Sets of firefighting equipment supported |

| Outputs | Activities | Benefits | Benefit measures | Benefit enhancement targets | Indicators |
|---|---|---|---|--|--|
| | Training and equipment support to promote compost production | <ul style="list-style-type: none"> • Increase in soil organic content in farmlands | <ul style="list-style-type: none"> • Compensate litter collectors and provide subsidy to compost manure • Production based subsidy in organic farming | <ul style="list-style-type: none"> • At least 50% share of fertilizer is compost manure | <ul style="list-style-type: none"> • Number of households practicing composting |
| IPack 5: Advocacy campaign: Gender-inclusive governance campaign | | | | | |
| Increased access of women to SNRM and knowledge and information | Create informal learning and sharing platforms for grassroots-level women | <ul style="list-style-type: none"> • Women empowered and their voices being respected | <ul style="list-style-type: none"> • Create and manage learning platform | <ul style="list-style-type: none"> • Five learning events | <ul style="list-style-type: none"> • Number of learning events |
| | Conduct local level policy discourses to ensure gender responsiveness and women's participation, access, control and leadership | <ul style="list-style-type: none"> • Women's participation, access, control and leadership developed and supported | <ul style="list-style-type: none"> • Interaction held between policy makers and targeted women | <ul style="list-style-type: none"> • One event | <ul style="list-style-type: none"> • Number of events |
| | Produce and publish best practices and learning in gendered governance | <ul style="list-style-type: none"> • Documentation and publication of gendered governance strengthened and institutionalized | <ul style="list-style-type: none"> • Sharing and publicity | <ul style="list-style-type: none"> • One best practice documented | <ul style="list-style-type: none"> • Number of best practices documented |
| Integrated gender and women's participation in local planning | Conduct rapid assessment on women's contribution and involvement in SNRM | <ul style="list-style-type: none"> • Women's contribution and participation increased | <ul style="list-style-type: none"> • Gender data disseminated | <ul style="list-style-type: none"> • One Sharing event | <ul style="list-style-type: none"> • Number of sharing events |

| Outputs | Activities | Benefits | Benefit measures | enhancement targets | Indicators |
|-------------------|---|---|--|---|---|
| processes in SNRM | Provide gender mainstreaming trainings/ workshops to local government and CBOs | <ul style="list-style-type: none"> • Women's capacity enhanced in GESI integration and local government and CBOs take the issues seriously | <ul style="list-style-type: none"> • Knowledge enhancement, accountability | <ul style="list-style-type: none"> • One training event for 20 government staffs | <ul style="list-style-type: none"> • Number of training events |
| | Conduct GESI focused social audits and public hearing | <ul style="list-style-type: none"> • Social transparency increased and regularly practiced | <ul style="list-style-type: none"> • Coverage of wider audience target group | <ul style="list-style-type: none"> • Two events | <ul style="list-style-type: none"> • Number of events |
| | Conduct advocacy campaign and promote awareness on gender responsive information, available provisions and resources among CBOs/ women groups | <ul style="list-style-type: none"> • Gender responsive information making women and marginalized groups empowered | <ul style="list-style-type: none"> • Awareness raising sessions | <ul style="list-style-type: none"> • Three events | <ul style="list-style-type: none"> • Number of events |
| | Engage male involvement to advocate gender and women's issues and concern in campaign | <ul style="list-style-type: none"> • Male roles changing and supportive for women empowerment | <ul style="list-style-type: none"> • Continues encouragement of male change agent to promote gender | <ul style="list-style-type: none"> • Two events | <ul style="list-style-type: none"> • Number of events |

5.6 Budget

Note: Budget estimations are tentative and done based on consultation workshops with key stakeholders at river system level during 2022. However, during time of implementation, the rate and amount mentioned in the CERP plans are subjected to change based on the changes in market situation as well as the field condition. Respective Provincial Project Management Offices (PPMUs) can make necessary changes based on field situation following the norms and rates as per the Nepal government rules and regulations.

Table 22: Budget plan

| Sub-activities | Unit | Quantity | Unit Cost | Budget (NPR) |
|---|-----------|----------|-----------|-------------------|
| IPack 1: Climate resilient agriculture and land use practices | | | | |
| Identification and operationalization of FFS | No | 3 | 700,000 | 2,100,000 |
| Capacity-building in the use of weather information and its application in agricultural practices | No | 2 | 100,000 | 200,000 |
| Implement climate resilient agriculture practices | ha | 800 | 2,000 | 1,600,000 |
| Train and support farmers to adopt and apply climate-resilient land use practices | Events | 7 | 500,000 | 3,500,000 |
| Support leasehold farming in abandoned agriculture land to pro-poor farmers | Villages | 3 | 500,000 | 1,500,000 |
| Promote On-farm water conservation measures for dry zone resilient agriculture practices | Household | 120 | 25,000 | 3,000,000 |
| Total Budget for IPack 1 (NRs) | | | | 11,900,000 |
| IPack 2: Improving/maintaining river system landscape through soil and water conservation | | | | |
| Establish On-farm tree nurseries | No | 2 | 600,000 | 1,200,000 |
| Promote agroforestry with multiyear cropping/horticulture /on-farm conservation | ha | 1,005 | 6,000 | 6,030,000 |
| Landslide treatment | No | 3 | | 6,500,000 |

| Sub-activities | Unit | Quantity | Unit Cost | Budget (NPR) |
|---|-----------------------|----------|-----------|-------------------|
| Construction of check dams and bioengineering for gully/debris torrent protection | Gulley/debris torrent | 1 | 2,500,000 | 2,500,000 |
| Green road management | Km | 10 | 500,000 | 5,000,000 |
| Training/capacity building on soil and watershed conservation using bio-engineering | Event | 1 | 500,000 | 500,000 |
| Climate resilient awareness campaign through Eco-clubs | School | 2 | 50,000 | 100,000 |
| Total Budget for IPack 2 (NRs) | | | | 21,830,000 |
| IPack 3: Capacity enhancement for sustainable forest management | | | | |
| Review/upgrade/renew of forest operational plans (FOPs) of community forest user groups (CFUGs) | No | 10 | 200,000 | 2,000,000 |
| Training and capacity development for implementation of FOPs | No | 10 | 250,000 | 2,500,000 |
| Equipment support for implementation of FOPs | No | 10 | 200,000 | 2,000,000 |
| Capacitate government staffs and CBOs on climate resilient forest management (TOF) | Event | 2 | 300,000 | 600,000 |
| Governance training to government staffs and CFUGs to enhance accountability and transparency | Event | 10 | 240,000 | 2,400,000 |
| Total Budget for IPack 3 (NRs) | | | | 9,500,000 |
| IPack 4: Restoration and rehabilitation of degraded forests | | | | |
| Establish and support multi-purpose tree nurseries (50,000) | No | 1 | 700,000 | 700,000 |
| Production of saplings | No | 50,000 | 40 | 2,000,000 |
| Enrichment plantation/ANR | ha | 5 | 50,000 | 250,000 |
| Firefighter training and support firefighting equipment to CFUGs | CFUG | 5 | 300,000 | 1,500,000 |

| Sub-activities | Unit | Quantity | Unit Cost | Budget (NPR) |
|---|---------|----------|-----------|-------------------|
| Support firefighting equipment to security institutions (Nepal Army, Nepal Police, Armed Police Force) | Sets | 5 | 150,000 | 750,000 |
| Training and equipment support to promote compost production from bushes and leaf litters | CFUG | 3 | 150,000 | 450,000 |
| Customize fire alert system in Community Based Forest Management (CBFM) | No | 1 | LS | 300,000 |
| Skill development trainings and equipment support | Hh | 50 | 25,000 | 1,250,000 |
| Total Budget for IPack 4 (NRs) | | | | 7,200,000 |
| IPack 5: Advocacy campaign: Gender-inclusive governance campaign | | | | |
| Create informal learning and sharing platforms for grassroots-level women | Event | 5 | 50,000 | 250,000 |
| Conduct local level policy discourses to ensure gender responsiveness and women's participation, access, control and leadership | Event | 1 | 50,000 | 50,000 |
| Produce and publish best practices and learning in gendered governance | Event | 1 | 50,000 | 50,000 |
| Conduct rapid assessment on women's contribution and involvement in SNRM | Event | 1 | 100,000 | 100,000 |
| Provide gender mainstreaming trainings/ workshops to local government and CBOs | Event | 1 | 100,000 | 100,000 |
| Conduct GESI focused social audits and public hearing | Event | 2 | 150,000 | 300,000 |
| Conduct advocacy campaign and promote awareness on gender responsive information, available provisions and resources among CBOs/ women groups | Meeting | 3 | 50,000 | 150,000 |
| Engage male involvement to advocate gender and women's issues and concern in campaign | Event | 2 | 50,000 | 100,000 |
| Total Budget for IPack 5 (NRs) | | | | 1,100,000 |
| Grand Total Budget (NRs) | | | | 51,530,000 |

Note: Budget estimations are tentative and are subjected to change based on the changes in market situation as well as the field condition

5.7 Monitoring and Reporting Protocol

River system level monitoring and reporting will be carried out by Ministry of Forest and Environment through PMU and PPMU of BRCRN.

Following monitoring protocol will be adopted to monitor the outputs of the CERP:

Table 23: Monitoring protocol

| Results | Indicator | Baseline | Target | Means of verification | Assumption |
|--|--|----------|---|---|--|
| Output 1: Restored degraded forests area halting forest fire, illegal harvesting and grazing | Area (in ha.) of natural forest restored through ANR and enrichment plantation | 0 | 5 ha of natural forest restored through ANR and enrichment plantation | PMU and PPMUs reports Project report | This river system has 5345.8 ha of forest and 178.8 ha of other wooded land (baseline survey report 2022) |
| Output 2: Improved natural Forest management and increased forest area outside the forest | xx ha of forest area of xx groups under implementation through updated forest management plan | 0 | 1704 ha area managed by 10 community forestry user groups | PMU and PPMUs reports Project report | 10 community forestry user groups manage 1704 ha of forest having 1620 ha (95.07%) of natural forest, 12 ha (0.70%) plantation forest and 72 ha (4.22%) degraded forest (CBO profile 2022) |
| | xx ha of new plantation outside forest area; and their survival rate (public land forestry and private forestry) | 0 | Area: 0 ha. Survival rate: 0% | | |
| Output 3: Minimized Impacts of climate induced disasters (erosion, landslides/ sedimentation and flooding) | Volume of sedimentation (Cubic meter of soil volume per unit area) | 0 | 25% in comparison before constructing structures | PMU and PPMUs reports Project report | Other climate-resilient SNRM practices (including Activities on climate-resilient land use, sustainable management of forests and reforestation) are successfully implemented, |

| Results | Indicator | Baseline | Target | Means of verification | Assumption |
|--|---|--|---|--|---|
| | | | | | further reducing potential for erosion and sedimentation |
| Output 4: Farmers adopted Climate resilient farming practices | Ha. of agricultural land under climate resilient farming/agriculture system | 0 ha | 800 ha | FFS record PPPMUs Reports Project report | |
| | Proportion of farmers trained by the project who begin to apply climate- resilient land use practices on their fields in the relevant season following their respective trainings | 0 | At least 80% of the farmers involved in project trainings begun to apply project-promoted climate-resilient land use practices in the season following their training | PMU and PPMUs reports Project report | The final selection of practices to be promoted at each specific training site are highly relevant to targeted farmers' cropping systems and conditions, as well as the climate change challenges with which they must contend. Trainings are delivered in a form and manner that is accessible to and relevant for, targeted farmers. |
| Output 5: Integrated gender and equity issues in governance practices in NRM/ CRLUP and management | % of women in leadership positions of CBO's executive committee | Out of 85 leadership position in CFUGs, 33 (38.8%) are women | At least 50% women in leadership position | DFO/PPMU/Group records | Proportional representation of all social groups ensured |

| Results | Indicator | Baseline | Target | Means of verification | Assumption |
|---------|---|----------|--|---------------------------|--|
| | Access of women in Natural resources management, CRLUP, knowledge and information | 0 | At least 50% women participation in all events | Group record/PPMU records | Proportional representation of all social groups ensured |
| | Integrate gender in local planning processes in NRM/ CRLUP and management | 0 | 10 Gender sensitive forest management operational plan of forestry user groups | PPMU/DFO/Group records | Gender dimensions ensured in climate resilient plan including forest management operational plan of groups |

Outcome and impact level result assessment will be carried out based on result framework of CERP (Annex-1) using BRCRN monitoring and evaluation framework. Output level results of this CERP fully aligned with the BRCRN outcome and impact indicators.

Activity level monitoring will be carried out based on work plan and budget. Joint monitoring mechanism will be established to monitor the activity and results.

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Annex-I: Result Framework of Sunkoshi Critical Ecosystem Restoration Plan

Vision: Climate resilient and sustainably managed Natural Resources and local communities in Sunkoshi River system

Result Framework

| Expected Results | Objectively verifiable Indicator | Baseline | Target | Means of verification | Assumptions |
|--|---|--|---|--|---|
| Impacts | | | | | |
| <p><i>GCF core indicator (Mitigation)</i></p> <p><i>A4.0 Improved resilience of ecosystems and ecosystem services (proxy indicator 2 to 5)</i></p> | <p>Tonnes of carbon dioxide equivalent (tCO₂eq) reduced or avoided.</p> <p>Proxy indicator: Area of</p> <p>(1) Deforestation rate: (2) Sustainable forest management area: (3) ANR area (4) Plantation area (5) Area of Climate Resilient Agriculture (CRA)</p> | <p>Proxy indicators:</p> <p>Deforestation rate: 0 Sustainable forest management area: 0 ha ANR: 0 ha Plantation area: 0 ha</p> <p>Climate Resilient Agriculture: 0 ha</p> | <p>Proxy indicator:</p> <p>Deforestation rate: 0 Sustainable forest management area: 1704 ha Plantation area: 0 ha ANR: 5 ha (including enrichment plantation) Climate Resilient Agriculture: 800 ha</p> | <p>PPMUs/PMU report</p> <p>GCF/BRCRN GHG mitigation calculation tool-based calculation sheet</p> | <p>This river system has 5345.8 ha of forest and 178.8 ha of other wooded land (baseline survey report 2022)</p> <p>CERP land use data shows changes in forest area between 2000 and 2019 is +91 ha. Hence, 0% deforestation rate.</p> <p>In this river system, 10 forestry user groups are managing 1704 ha of forest (CBO profile 2022)</p> |
| <p><i>GCF core indicator (Adaptation)</i></p> | <p>Total number of direct and indirect beneficiaries (gender disaggregated)</p> | | <p>Direct Male: 2121 Female: 2242 Total : 4363</p> | <p>PMU, PPMUs report Project report</p> | <p>In this river system, 977 HHs associated with community forest user groups having</p> |

| Expected Results | Objectively verifiable Indicator | Baseline | Target | Means of verification | Assumptions |
|--|--|-----------------------------|--|---|--|
| | | | | | 4363 population with 2121 male and 2242 female. |
| Outcomes | | | | | |
| M9.0 Improved management of land or forest areas contributing to emissions reductions | M9.1 Hectares of land or forests under improved and effective management that contributes to CO ₂ emission reductions | | Sustainable forest management area: 1704 ha Plantation area: 0 ha ANR: 5 ha (including enrichment plantation) Climate Resilient Agriculture: 800 ha | Maps/remote sensing Project reports | Beneficiaries adopt climate-resilient land use practices |
| A8.0 Strengthened awareness of climate change threats and risk reduction processes | A8.1 Number of males and females made aware of climate threats and related appropriate responses | 0 men 0 women 0 total | Male: 2121 Female: 2242 Total : 4363 | Project progress report Workshop/training Attendance sheets and materials | Beneficiaries are interested in adopting climate resilient land use practices |
| Outputs | | | | | |
| Output 1: Restored degraded forests area halting forest fire, illegal harvesting and grazing | Area (in ha.) of natural forest restored through ANR and enrichment plantation | 0 | 5 ha of natural forest restored through ANR and enrichment plantation | PMU and PPMUs reports Project report | This river system has 5345.8 ha of forest and 178.8 ha of other wooded land (baseline survey report 2022) |
| Output 2: Improved natural Forest management and increased forest area outside the forest | xx ha of forest area of xx groups under implementation through updated forest management plan | 0 | 1704 ha area managed by 10community forestry user groups | PMU and PPMUs reports Project report | 10 community forestry user groups manage 1704 ha of forest having 1620 ha (95.07%) of natural forest, 12 ha (0.70%) plantation forest and 72 ha (4.22%) degraded forest (CBO profile 2022) |
| | xx ha of new plantation outside forest area; and | 0 | Area: 0 ha. Survival rate: 0% | | |

| Expected Results | Objectively verifiable Indicator | Baseline | Target | Means of verification | Assumptions |
|--|--|--|--|--|---|
| | their survival rate (public land forestry and private forestry) | | | | |
| Output 3: Minimized Impacts of climate induced disasters (erosion, landslides/ sedimentation and flooding) | Volume of sedimentation (Cubic meter of soil volume per unit area) | NA | 25% in comparison to before constructing structures | PMU and PPMUs reports Project report | Other climate-resilient SNRM practices (including Activities on climate-resilient land use, sustainable management of forests and reforestation) are successfully implemented, further reducing potential for erosion and sedimentation |
| Output 4: Farmers adopted Climate resilient farming practices | Ha. of agricultural land under climate resilient farming/agriculture system | 0 ha | 800 ha | FFS record PPPMUs Reports Project report | |
| | Proportion of farmers trained by the project who begin to apply climate-resilient land use practices on their fields in the relevant season following their respective trainings | 0 | At least 80% of the farmers involved in project trainings begun to apply project- promoted climate-resilient land use practices in the season following their training | PMU and PPMUs reports Project report | The final selection of practices to be promoted at each specific training site are highly relevant to targeted farmers' cropping systems and conditions, as well as the climate change challenges with which they must contend. Trainings are delivered in a form and manner that is accessible to and relevant for, targeted farmers. |
| Output 5: Integrated gender and equity issues in governance practices | % of women in leadership positions of CBO's executive committee | Out of 85 leadership position in CFUGs, 33 | At least 50% women in leadership position | DFO/PPMU/Group records | Proportional representation of all social groups ensured |

| Expected Results | Objectively verifiable Indicator | Baseline | Target | Means of verification | Assumptions |
|------------------------------|---|-------------------|--|---------------------------|--|
| in NRM/ CRLUP and management | | (38.8%) are women | | | |
| | Access of women in Natural resources management, CRLUP, knowledge and information | 0 | At least 50% women participation in all events | Group record/PPMU records | Proportional representation of all social groups ensured |
| | Integrate gender in local planning processes in NRM/ CRLUP and management | 0 | 10 Gender sensitive forest management operational plan of forestry user groups | PPMU/DFO/Group records | Gender dimensions ensured in climate resilient plan including forest management operational plan of groups |

Activities

| Activities | Description | Sub-activities | Remarks/Deliverables |
|---|--|--|---|
| Output 1: Restored degraded forests area halting forest fire, illegal harvesting and grazing | | | |
| 1.1 Forest fire control | Support and strengthen forestry-related CBOs to combat forest fire. | 1.1.1 Firefighter training and support firefighting equipment to CFUGs 1.1.2 Training and equipment support to promote compost production 1.1.3 Support firefighting equipment to security institution 1.1.4 Customize fire alert system in Community Based Forest Management (CBFM) | At least 5 CFUGs of most fire prone community forests supported with firefighting equipment |
| 1.2 Income source of poor/marginalized forest users enhanced halting illegal harvesting | Enhance income generation opportunities for forest dependent women, IPs, Dalits and poor/marginalized people to reduce pressure on forest resources. | 1.2.1 Skill development trainings and equipment support | Approximately 50 household beneficiaries |
| Output 2: Improved natural forest management | | | |
| 2.1 Strengthening forest management | Improving the application of sustainable forest management practices in all forest land managed by forestry-related CBOs within project area, ensuring silvicultural practices are implemented and maximizing ecosystem service provision and resilience, as well as generating significant climate change benefits. | 2.1.1 Review/upgrade/renew of forest operational plans (FOPs) of community based forest user groups (CFUGs) and provide implementation support 2.1.2 Training and capacity development for implementation of FOPs 2.1.3 Equipment support for implementation of FOPs 2.1.4 Capacitate government staffs and CBOs on climate resilient forest management (Training of Facilitators) 2.1.5 Governance training to government staffs and CFUGs to enhance accountability and transparency | Approximately 10 forest operational plans developed and/or strengthened. Approximately 2 ToF events organized to capacitate government staffs and CBOs on climate resilient forest management. |
| 2.2 Improvement of forest cover through enrichment plantation and ANR | Support different types of forest plantation to build resilience and deliver important mitigation benefits. | 2.2.1 Establish and support multi-purpose tree nurseries 2.2.2 Enrichment plantation/Assisted natural regeneration in forest area | 1 multi-purpose nursery established Enrichment plantation/ANR implemented on 5 ha of community managed forest land. |

| Activities | Description | Sub-activities | Remarks/Deliverables |
|--|---|---|---|
| Output 3: Minimized impacts of climate induced disasters (erosion and landslides/sedimentation) | | | |
| 3.1 Controlling erosion/landslide and management of sedimentation | Construct local structures, as well as bioengineering that will reduce community vulnerability to erosion and landslides. | 3.1.1 Landslide treatment 3.1.2 Construction of check dams and bioengineering for gully/Debris torrent protection 3.1.3 Green road management | Establish relevant structures and practices to stabilize 3 landslides and 1 gully/debris torrents mostly in Churia hills |
| 3.2 Strengthening disaster risk management and awareness creation on climate resilient NRM | Improving disaster risk management in collaboration with local government and capacity strengthening for disaster risk reduction, as well as awareness creation for climate resilient natural resource management | 3.2.1 Training/capacity building on soil and watershed conservation using bio-engineering 3.2.2 Climate resilient awareness campaign through Eco-clubs | 5 days training for Government staffs/CBFMG/Farmer groups on soil and watershed conservation using bio-engineering Student-run eco-clubs established |
| Output 4: Farmers adopted Climate resilient farming practices | | | |
| 4.1 Establish and operationalize Farmers field schools (FFS) | Establish training sites on which farmers can be trained on climate resilient farming practices during and after the project. | 4.1.1 Operationalize Farmer's Field Schools on adopting climate resilient land use practices 4.1.2 Capacity-building in the use of weather information and its application in agricultural practices | 3 FFS established and operational |
| 4.2 Implementation of climate-resilient land use practices (pest and disease minimized, soil quality improved, irrigation facility enhanced) | Support and strengthen farmers' capacities to adopt/apply climate-resilient farming practices in their own fields. | 4.2.1 Implement climate resilient agriculture practices (including pest and disease control, soil quality improvement, irrigation facility enhancement) 4.2.2 Train and support farmers to adopt and apply climate-resilient land use practices 4.2.3 Support leasehold farming in abandoned agriculture land to pro-poor farmers 4.2.4 Promote On-farm water conservation measures for dry zone resilient agriculture practices | Climate-resilient land use practices adopted/applied in 800 ha of farmlands |
| 4.3 Agroforestry Promotion | Support and strengthen farmers' capacity to adopt/apply suitable agroforestry and livestock management practices on their own land. | 4.3.1 Promote agroforestry with multiyear cropping/horticulture/on-farm conservation 4.3.2 Establish on-farm tree nursery and support livestock rearing 4.3.3 Production/Purchase of saplings | 2 on-farm tree nurseries established Agroforestry established in 1005 ha marginal land |
| Output 5: Integrated gender and equity issues in governance practices in NRM/ CRLUP and management | | | |

| Activities | Description | Sub-activities | Remarks/Deliverables |
|--|--|---|--|
| 5.1 Increase access of women to SNRM and knowledge and information | Establish platforms for women's involvement and access to knowledge and information, as well as build capacity in natural resource management and climate resilient land use practices | 5.1.1 Create informal learning and sharing platforms for grassroots-level women 5.1.2 Conduct local level policy discourses to ensure gender responsiveness and women's participation, access, control and leadership 5.1.3 Produce and publish best practices and learning in gendered governance | With enhanced access to knowledge and information, more women involved in natural resource management and climate resilient land use practices |
| 5.2 Integrate gender in local planning processes in SNRM | Sensitize CBOs, women groups, local government and other concerned stakeholders on gender responsive information, available provisions and resources to ensure GESI integration in local planning processes for natural resource management and climate resilient land use practices | 5.2.1 Conduct rapid assessment on women's contribution and involvement in SNRM 5.2.2 Provide gender mainstreaming trainings/workshops to local government and CBOs and concerned stakeholders 5.2.3 Conduct GESI focused social audits and public hearing 5.2.4 Conduct advocacy campaign and promote awareness on gender responsive information, available provisions and resources among CBOs/ women groups 5.2.5 Engage male involvement to advocate gender and women's issues and concern in campaign | GESI integration ensured in local planning processes for natural resource management and climate resilient land use practices |

Annex-2: List of Participants

A. Problem and Solution Analysis Workshop

| S. N. | Name of Participants | Address | Institution | Designation | Contact No. |
|-------|----------------------|----------|---|---|-------------|
| 1 | Tara Rai | Belaka-7 | Belaka Municipality | Municipal Committee Member | 9816763320 |
| 2 | Ram Bahadur Karki | Belaka-7 | Belaka Municipality | Municipal Forest and Environment Committee Member | 9804319227 |
| 3 | Taraman Rai | Belaka-7 | Pahichan Farmers Group | | 9815794234 |
| 4 | Than Raj Rai | Belaka-7 | Pahichan Farmers Group | | 9823177998 |
| 5 | Bishal Rai | Belaka-7 | Janachetana Farmers Group | | 9816308490 |
| 6 | Manisha Rai | Belaka | Dudhkoshi CFUG | Member | 9827037141 |
| 7 | Tawalmaya Rai | Belaka-7 | Sakenwa Farmers Group | | 9860537278 |
| 8 | Sudeep Rai | Belaka-8 | Bharanga Thani Farmers Group | | 9818030071 |
| 9 | Nir Bahadur Rai | Belaka-8 | Shree Chomalungma CFUG | Chairman | 9815341737 |
| 10 | Kanchan Rai | Belaka | Belaka Municipality | Agriculture Technician | 9841427094 |
| 11 | Bhabin Kumar Rai | Belaka-8 | Khasma Jhatol Agriculture and Livestock Group | | 9810473245 |
| 12 | Milan Rai | Belaka-8 | Champakeshari CFUG | | 9842565854 |
| 13 | Gyan Bahadur Rai | Belaka-7 | Pahichan Agriculture Cooperatives | | 9842420939 |
| 14 | Gitendra Rai | Belaka | Belaka Municipality | Ward Technician | 9847302069 |
| 15 | Uendra Bahadur Thapa | Belaka | Belaka Municipality | Assistant Sub-Engineer | 9852835410 |
| 16 | Indrakala Rai | Belaka-7 | Anko Bungwakha Farmers Group | Member | 9863345308 |
| 17 | Saraswoti Rai | Belaka | Janachetana Farmers Group | | 9807305147 |
| 18 | Kamal Rai | Belaka-7 | Anko Bungwakha Farmers Group | Member | 9842287664 |
| 19 | Ram Bahadur Rai | Belaka-7 | | | |
| 20 | Binita Khadka | Belaka | Belaka Municipality | Forest Ranger | 9865514878 |

Disaggregated Participants Data

| S. N. | Name of Participants | Gender | | Ethnicity | | | | | | |
|--------------|-----------------------|-----------|----------|-----------|----------|----------|----------|----------|----------|----------|
| | | Male | Female | Janajati | Dalit | Brahmin | Chhettri | Dasnami | Madhesi | Muslim |
| 1 | Tara Rai | | 1 | 1 | | | | | | |
| 2 | Ram Bahadur Karki | 1 | | | | | 1 | | | |
| 3 | Taraman Rai | 1 | | 1 | | | | | | |
| 4 | Than Raj Rai | 1 | | 1 | | | | | | |
| 5 | Bishal Rai | 1 | | 1 | | | | | | |
| 6 | Manisha Rai | | 1 | 1 | | | | | | |
| 7 | Tawalmaya Rai | | 1 | 1 | | | | | | |
| 8 | Sudeep Rai | 1 | | 1 | | | | | | |
| 9 | Nir Bahadur Rai | 1 | | 1 | | | | | | |
| 10 | Kanchan Rai | | 1 | 1 | | | | | | |
| 11 | Bhabin Kumar Rai | 1 | | 1 | | | | | | |
| 12 | Milan Rai | 1 | | 1 | | | | | | |
| 13 | Gyan Bahadur Rai | 1 | | 1 | | | | | | |
| 14 | Gitendra Rai | 1 | | 1 | | | | | | |
| 15 | Upendra Bahadur Thapa | 1 | | | | | 1 | | | |
| 16 | Indrakala Rai | | 1 | 1 | | | | | | |
| 17 | Saraswoti Rai | | 1 | 1 | | | | | | |
| 18 | Kamal Rai | 1 | | 1 | | | | | | |
| 19 | Ram Bahadur Rai | 1 | | 1 | | | | | | |
| 20 | Binita Khadka | | 1 | | | | 1 | | | |
| Total | | 13 | 7 | 17 | 0 | 0 | 3 | 0 | 0 | 0 |

B. Expert Planning Workshop

| | |
|-------------------------|---|
| River Systems | Tawa South, Adheri-Baruwa-Dwar, Gidari and Sunkoshi |
| Date of Workshop | August 21 - 22, 2022 |
| Venue | Hotel Kohbar |
| Location | Gaighat, Udayapur |

| S. N. | Name of Participants | Institution | Designation | Contact No. | Email |
|-------|-------------------------|-----------------------------|-------------------------------------|-------------|--|
| 1 | Ambika Pd. Poudel | DFO Gaighat, Udayapur | DFO | 9852835134 | ambikapoudel12@gmail.com |
| 2 | Raj Kumar Gupta | PCTMCD, Salakpur, Morang | Unit Head | 9852077936 | raigupta2003@gmail.com |
| 3 | Umesh Budhathoki | PPMU, BRCRN | Assistant Soil Conservation Officer | 9857085564 | umesh.budhathoki@gmail.com |
| 4 | Dilip Prasad Gupta | Province Forest Directorate | Assistant Forest Officer | 9842552666 | pradeshforest@gmail.com |
| 5 | Kashi Narayan Chaudhari | DFO, Triveni | AFO | 9864226567 | kashichaudhari@gmail.com |
| 6 | Ram Singh Chaudhari | SDFO, Sunpur | Forest Guard | 9842450556 | |
| 7 | Binod Kumar Shah | SDFO, Tapeswari | AFO | 9842050118 | binodshah566@gmail.com |
| 8 | Bindeswar Shah | SDFO, Katari | Forest officer | 9848117063 | sahbindeswar21@gmail.com |
| 9 | Raj Kishor Mandal | MoFESC, Biratnagar | ASCO | 9842635267 | rkm2022@gmail.com |
| 10 | Ram Bhagat Yadav | SDFO, Swanku | AFO | 9842825218 | ramvagaty7@gmail.com |
| 11 | Dev Chandra Girte | SDFO, Nepaltar | AFO | 9846055012 | dev3760@gmail.com |
| 12 | Dharm Dev Thakur | SDFO, Rampur | AFO | 9844671151 | dharmadev35@gmail.com |
| 13 | Sanni Kumar Jha | SDFO, Mainamaini | AFO | 9841249173 | jha.sunnykumar1@gmail.com |
| 14 | Arvind Pandey | DFO, Udaypur, Triveni | AFO | 9842096201 | arvindpanday56568@gmail.com |
| 15 | Kamala Lpo | BMC, Koshi | ASCO | 9846717055 | kamala401@gmail.com |
| 16 | Kamala Shrestha | DFO, Gaighat | Forest Ranger | 9842837606 | |
| 17 | Ajay Chandra Subedi | SWMO, Okhaladhunga | ASCO | 9855063076 | ajay.subedi02@gmail.com |
| 18 | Ram Krishna Rajthala | BMC, Koshi | Senior Watershed Management Officer | 9852835204 | rkrajthala3a@gmail.com |
| 19 | Sushil Bhandari | PPMU, BRCRN-Itahari | Project Coordinator | 9852074085 | sbhandari7@gmail.com |
| 20 | Anu BC | ADC, Gaighat, Udaypur | Agriculture Officer | 9842065006 | sanub2004@gmail.com |
| 21 | Bijay Kumar Yadav | SDFO, Beltar | AFO | 9849391436 | bijay00yadav00@gmail.com |
| 22 | Raj Kumar Shrestha | DFO, Udaypur | AFO | 9849148020 | rajshrestha10@gmail.com |
| 23 | Narayan Shrestha | FAO-TA KTM | NIPS | 9851040880 | narayan.shrestha@fao.org |
| 24 | Dron Kumari Rai | Triyuga-4 Udaypur | Hemwanti Nepal | 9842869064 | rai.drona123@gmail.com |

| S. N. | Name of Participants | Institution | Designation | Contact No. | Email |
|-------|----------------------|--------------|-------------|-------------|--|
| 25 | Punya Prasad Paudel | DFO, Udaypur | Ranger | 9852837222 | punyapaudel28@gmail.com |

Annex-3: Activities, Location and Budget Plan

Note: The location coordinates of planned activity sites listed in table below are the result of participatory mapping exercise conducted with local stakeholders who demarcated the intervention location in the map with google image in background. Some of the locations (approximately 30% of the sites) are verified in the field for their accuracy and validity. However, due to time and resource constraint for field verification, all identified location coordinates are not verified in field. Hence, location coordinates mentioned in CERP activity sites need further field verification before the implementation. Locations are subjected to change as per the field findings and verification result. Intervention site coordinate mentioned in this CERP Annexes should be taken only as initial guidance to start the field process and, if they are found inappropriate during the field verification, the technical team from PPMU can conduct location changes with proper documentation of field condition

| Sub-activities | Unit | Quantity | Unit Cost | Budget (NPR) | Location | Lat. | Long. | Activity Code |
|---|-------|----------|-----------|--------------|-----------------------------|-----------|-----------|---------------|
| Identification and operationalization of FFS | | | | | | | | AI.1 |
| FFS at Janachetana Krishi Samuha | No | 1 | 700,000 | 700,000 | Harkha | 87.127797 | 26.893187 | AI.1.1 |
| FFS at Namuna Mahila Krishak Samuha | No | 1 | 700,000 | 700,000 | Deurali | 87.054425 | 26.881058 | AI.1.2 |
| FFS at Nawaguras Krishi Samuha | No | 1 | 700,000 | 700,000 | Pikmire | 87.080044 | 26.880898 | AI.1.3 |
| Capacity-building in the use of weather information and its application in agricultural practices | No | 2 | 100,000 | 200,000 | | | | AI.1.4 |
| Implement climate resilient agriculture practices | ha | 800 | 2,000 | 1,600,000 | Belaka-7 | 87.123894 | 26.895201 | AI.2 |
| Train and support farmers to adopt and apply climate-resilient land use practices | Event | 1 | 500,000 | 500,000 | Baksikhop (Sisne khola CF) | 87.071443 | 87.071443 | AI.3.1 |
| | Event | 1 | 500,000 | 500,000 | Lapha (Ghare CF) | 87.032583 | 87.032583 | AI.3.2 |
| | Event | 1 | 500,000 | 500,000 | Champakot (Champakesari CF) | 87.137866 | 87.137866 | AI.3.3 |
| | Event | 1 | 500,000 | 500,000 | Rakchegaun | 87.069094 | 87.069094 | AI.3.4 |

| Sub-activities | Unit | Quantity | Unit Cost | Budget (NPR) | Location | Lat. | Long. | Activity Code |
|--|-----------|----------|-----------|--------------|--|-----------|-----------|---------------|
| | Event | 1 | 500,000 | 500,000 | Wachen | 87.121545 | 87.121545 | A1.3.5 |
| | Event | 1 | 500,000 | 500,000 | Pumathumka | 87.05306 | 87.05306 | A1.3.6 |
| | Event | 1 | 500,000 | 500,000 | Barigaun | 87.155894 | 87.155894 | A1.3.7 |
| Support leasehold farming in abandoned agriculture land to pro-poor farmers | Villages | 3 | 500,000 | 1,500,000 | Rakchegaun, Khecha & Anmarang | | | A1.4 |
| Promote On-farm water conservation measures for dry zone resilient agriculture practices | Household | 120 | 25,000 | 3,000,000 | Bilimla, Karka, Rusten, Kokama, Barigaun & Mulgaun | | | A1.5 |
| Establish On-farm tree nurseries | No | 2 | 600,000 | 1,200,000 | Pumathumka & Bilimla | | | M2.1 |
| Promote agroforestry with multiyear cropping/horticulture/on-farm conservation | ha | 45 | 6,000 | 270,000 | Pokhare-Banthuwa | 86.973067 | 26.870448 | A2.2.1 |
| | ha | 30 | 6,000 | 180,000 | Deuraja | 86.994425 | 26.867195 | A2.2.2 |
| | ha | 20 | 6,000 | 120,000 | Deuraje | 87.004203 | 26.868821 | A2.2.3 |
| | ha | 50 | 6,000 | 300,000 | Katunje | 87.034879 | 26.876548 | A2.2.4 |
| | ha | 70 | 6,000 | 420,000 | Pumathumka | 87.070872 | 26.879646 | A2.2.5 |
| | ha | 50 | 6,000 | 300,000 | Pipre | 87.087336 | 26.881319 | A2.2.6 |
| | ha | 135 | 6,000 | 810,000 | Dhakmalung | 87.148971 | 26.887419 | A2.2.7 |
| | ha | 40 | 6,000 | 240,000 | Khamare | 87.141252 | 26.901626 | A2.2.8 |
| | ha | 25 | 6,000 | 150,000 | Delukha | 87.121764 | 26.8883 | A2.2.9 |
| | ha | 40 | 6,000 | 240,000 | Khecha | 87.104386 | 26.895376 | A2.2.10 |
| | ha | 25 | 6,000 | 150,000 | Ramtang Khola upstream | 87.100612 | 26.901755 | A2.2.11 |
| | ha | 40 | 6,000 | 240,000 | Khecha | 87.118383 | 26.901756 | A2.2.12 |
| | ha | 55 | 6,000 | 330,000 | Wachen | 87.130441 | 26.909098 | A2.2.13 |
| | ha | 90 | 6,000 | 540,000 | Champakot | 87.141609 | 26.869648 | A2.2.14 |

| Sub-activities | Unit | Quantity | Unit Cost | Budget (NPR) | Location | Lat. | Long. | Activity Code |
|---|----------------------|----------|-----------|--------------|---|-----------|-----------|---------------|
| | ha | 35 | 6,000 | 210,000 | Ahaledanda | 87.117378 | 26.871666 | A2.2.15 |
| | ha | 25 | 6,000 | 150,000 | Bilimla | 87.117158 | 26.893433 | A2.2.16 |
| | ha | 105 | 6,000 | 630,000 | Anmarang-Hangmachong | 87.149844 | 26.904509 | A2.2.17 |
| | ha | 20 | 6,000 | 120,000 | Gharegaun | 87.052507 | 26.901565 | A2.2.18 |
| | ha | 10 | 6,000 | 60,000 | Dudhe CF | 86.993881 | 26.886968 | A2.2.19 |
| | ha | 30 | 6,000 | 180,000 | Mainatar | 87.107169 | 26.911136 | A2.2.20 |
| | ha | 25 | 6,000 | 150,000 | Lamabun | 87.109304 | 26.884258 | A2.2.21 |
| | ha | 40 | 6,000 | 240,000 | Hangdang | 87.084061 | 26.895119 | A2.2.22 |
| Landslide treatment | No | 1 | 2,000,000 | 2,000,000 | Dhakmalung | 87.143937 | 26.88341 | A2.3.1 |
| | No | 1 | 2,500,000 | 2,500,000 | Katunje | 87.041053 | 26.880584 | A2.3.2 |
| | No | 1 | 2,000,000 | 2,000,000 | Wachen | 87.124108 | 26.912566 | A2.3.3 |
| Construction of check dams and bio-engineering for gully/debris torrent protection | Gully/debris torrent | 1 | 2,500,000 | 2,500,000 | On demand | | | A2.4 |
| Green Road management | Km | 10 | 500,000 | 5,000,000 | On demand | | | A2.5 |
| Training/capacity building on soil and watershed conservation using bio-engineering | Event | 1 | 500,000 | 500,000 | | | | A2.6 |
| Climate resilient awareness campaign through Eco-clubs | School | 2 | 50,000 | 100,000 | | | | A2.7 |
| Support review/upgrade/renew of forest operational plans (FOPs) of community forest user groups (CFUGs) | No | 10 | 200,000 | 2,000,000 | Starting from Community Based Forest Management Groups (CBFMGs) with higher willingness to participate and not having any | | | M3.1 |
| | No | 10 | 250,000 | 2,500,000 | | | | M3.2 |

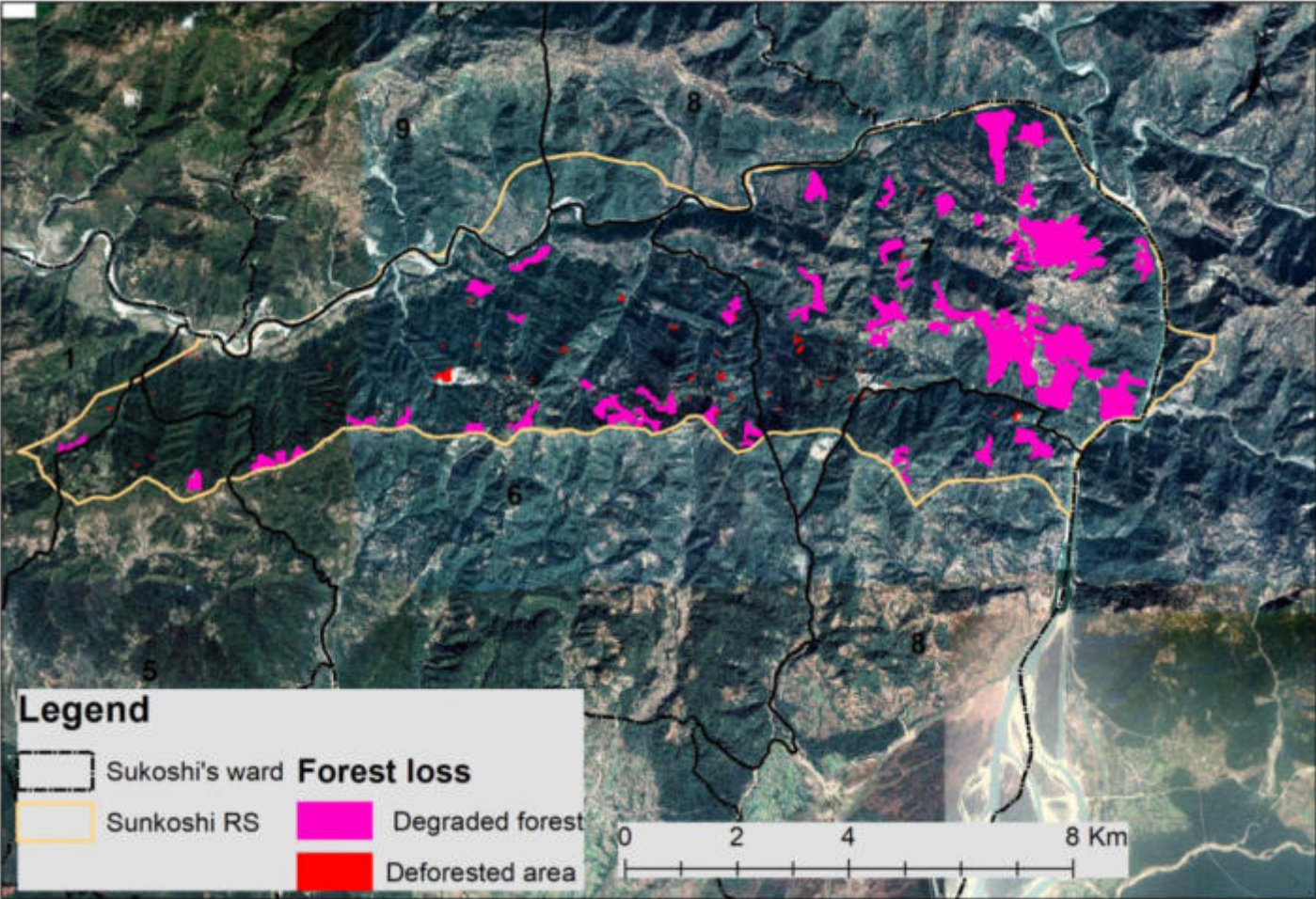
| Sub-activities | Unit | Quantity | Unit Cost | Budget (NPR) | Location | Lat. | Long. | Activity Code |
|---|------------|----------|-----------|--------------|---------------------------------|------|-------|---------------|
| Equipment support for implementation of FOPs | No | 10 | 200,000 | 2,000,000 | technical and financial dispute | | | M3.3 |
| Capacitate government staffs and CBOs on climate resilient forest management (TOF) | Event | 2 | 300,000 | 600,000 | | | | M3.4 |
| Governance training to government staffs and CFUGs to enhance accountability and transparency | Event | 10 | 240,000 | 2,400,000 | | | | M3.5 |
| Establish and support multi-purpose tree nurseries (50,000) | No | 1 | 700,000 | 700,000 | Mainamaini Sub-division | | | M4.1.1 |
| Production of saplings | No | 50,000 | 40 | 2,000,000 | | | | M4.1.2 |
| Enrichment plantation/ANR | ha | 5 | 50,000 | 250,000 | On demand | | | M4.2 |
| Firefighter training and support firefighting equipment to CFUGs | CFUG | 5 | 300,000 | 1,500,000 | | | | M4.3.1 |
| Support firefighting equipment to security institutions (Nepal Army, Nepal Police, Armed Police Force) | Sets | 5 | 150,000 | 750,000 | | | | M4.3.2 |
| Training and equipment support to promote compost production from bushes and leaf litters | CFUG | 3 | 150,000 | 450,000 | | | | M4.3.3 |
| Customize fire alert system in Community Based Forest Management (CBFM) | No | 1 | LS | 300,000 | | | | M4.3.4 |
| Skill development trainings and equipment support | Households | 50 | 25,000 | 1,250,000 | | | | M4.4 |
| Create informal learning and sharing platforms for grassroots-level women | Event | 5 | 50,000 | 250,000 | | | | |
| Conduct local level policy discourses to ensure gender responsiveness and women's participation, access, control and leadership | Event | 1 | 50,000 | 50,000 | | | | |

| Sub-activities | Unit | Quantity | Unit Cost | Budget (NPR) | Location | Lat. | Long. | Activity Code |
|---|---------|----------|-----------|-------------------|----------|------|-------|---------------|
| Produce and publish best practices and learning in gendered governance | Event | 1 | 50,000 | 50,000 | | | | |
| Conduct rapid assessment on women's contribution and involvement in SNRM | Event | 1 | 100,000 | 100,000 | | | | |
| Provide gender mainstreaming trainings/workshops to local government and CBOs | Event | 1 | 100,000 | 100,000 | | | | |
| Conduct GESI focused social audits and public hearing | Event | 2 | 150,000 | 300,000 | | | | |
| Conduct advocacy campaign and promote awareness on gender responsive information, available provisions and resources among CBOs/ women groups | Meeting | 3 | 50,000 | 150,000 | | | | |
| Engage male involvement to advocate gender and women's issues and concern in campaign | Event | 2 | 50,000 | 100,000 | | | | |
| Total | | | | 51,530,000 | | | | |

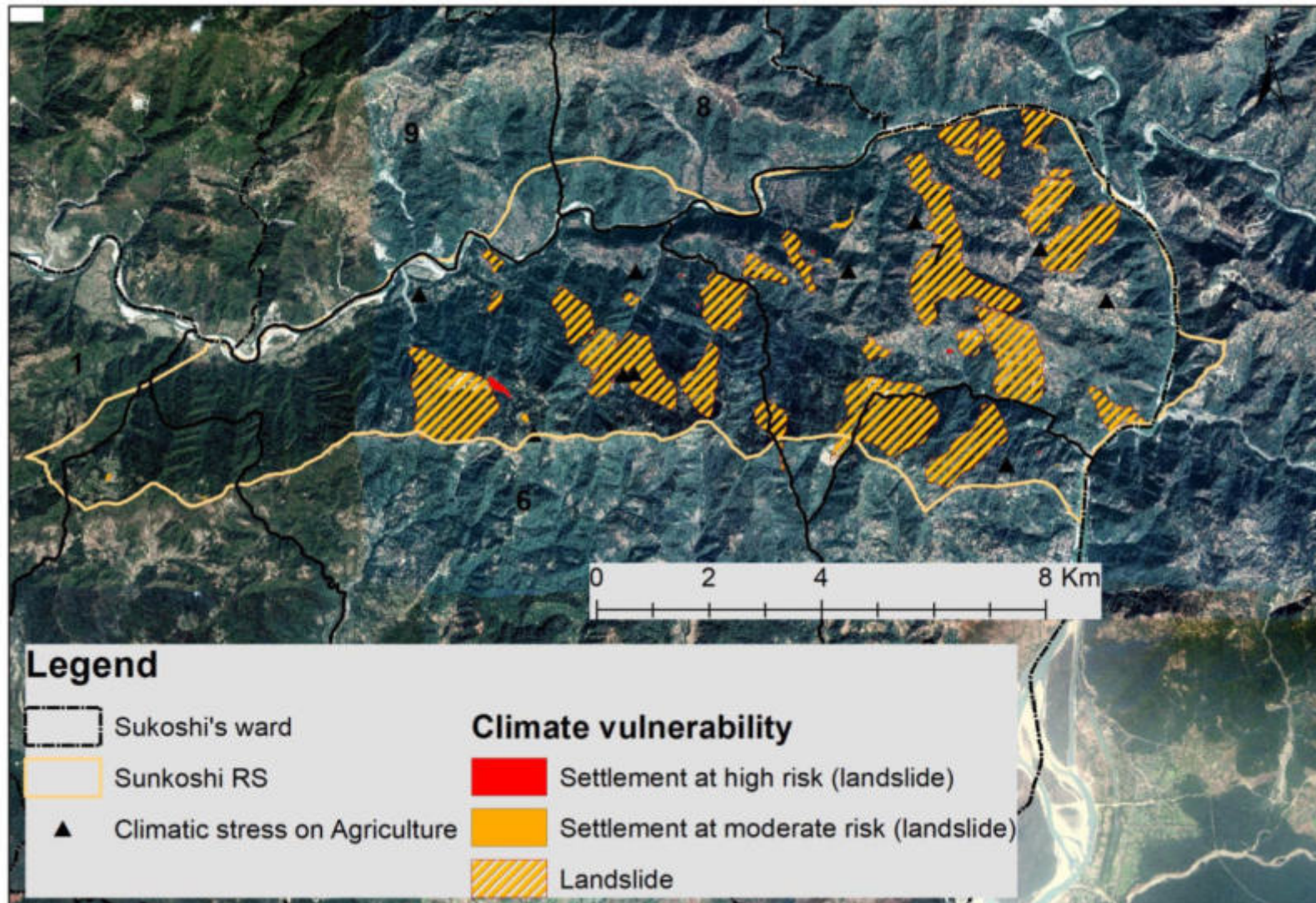
Note: Activity location and coordinates are subjected to change based on field condition before the implementation. BRCRN PPMU offices can make the necessary changes with proper documentation of field condition

Annex-4: Maps

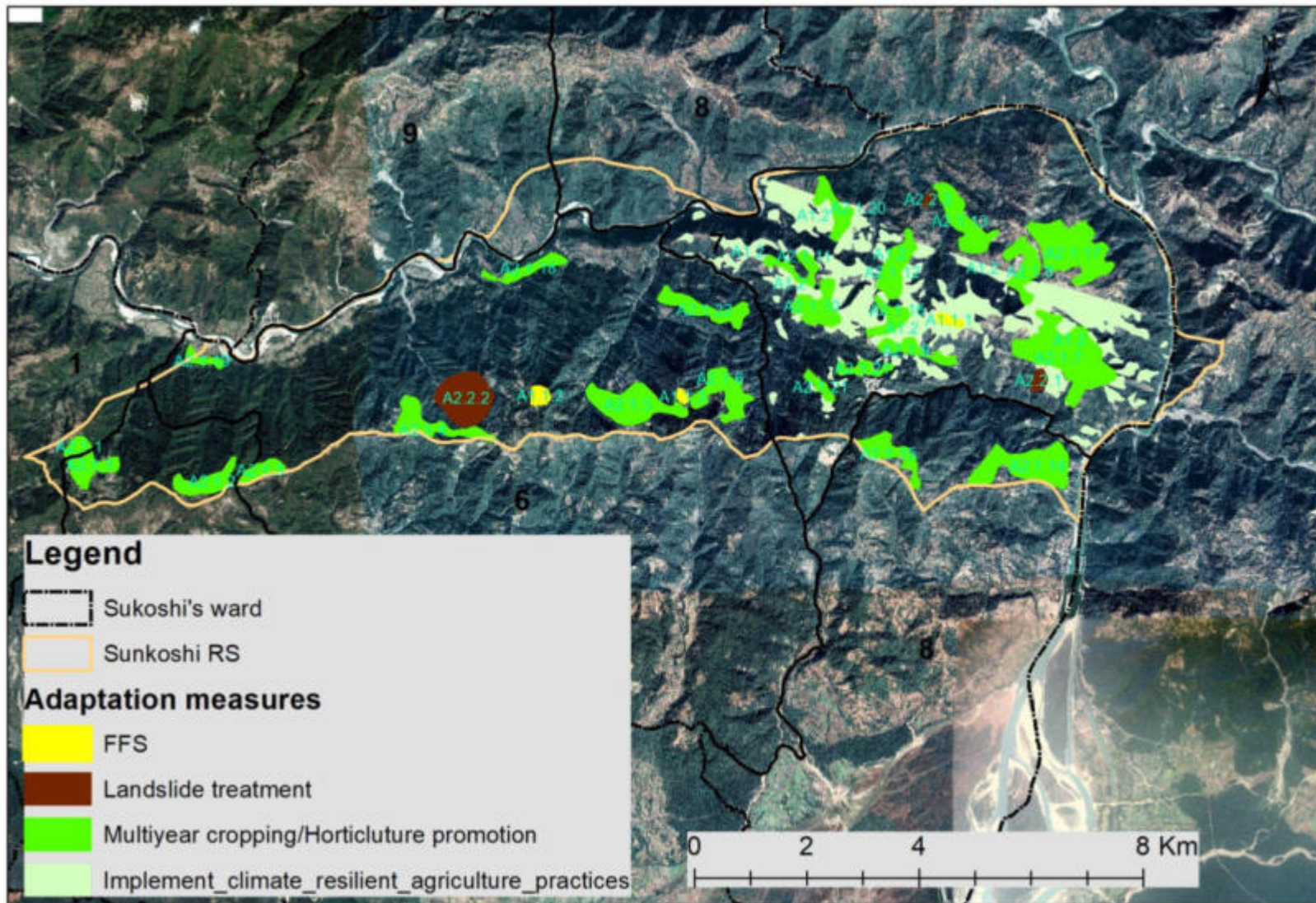
Hotspots for Forest Loss (D&FD)



Hotspots for Climate Adaptation



Final Activity Map for Adaptation



Annex-5: Photographs

A. Problem and Solution Analysis Workshop





B. Expert Planning Workshop



C. Hotspot Verification



D. Focus Group Discussions and KII



